TECHNOLOGY DEPT.

FLIGHT MAGAZINE

NOVEMBER 1956
50 cents

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DETROIT M.B.

Vol 45—
#11

PIPER APACHE FOR 1957

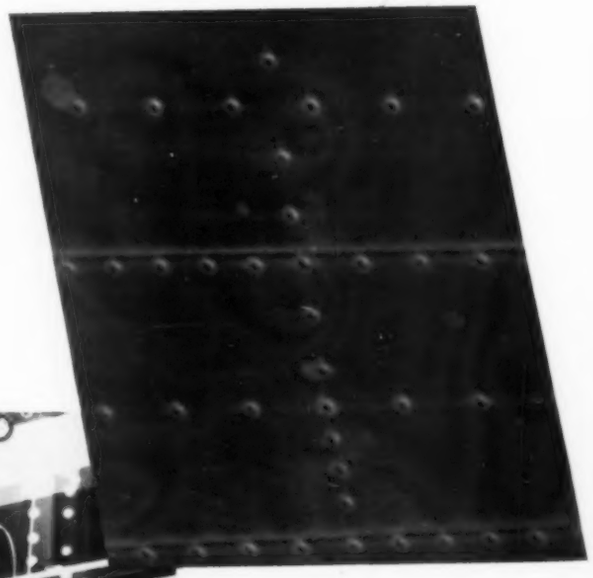
See page 24

at Aero of Atlanta

examination is more than skin-deep!

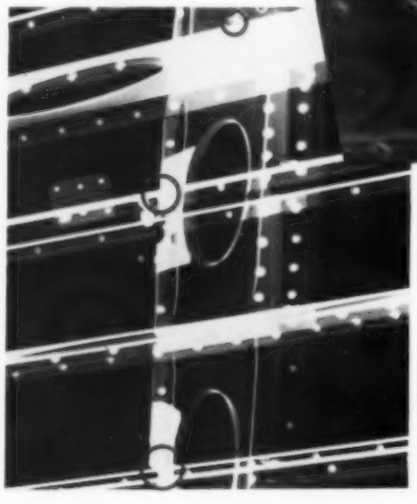
To the airplane mechanic as well as the physician, the X-ray reveals hidden conditions. Structural flaws are brought to light. To the knowledge thus gained we bring skilled hands.

X-ray inspection of multi-engine aircraft is just one of many services found in the *complete* shop facilities of Aero Corporation.



▲ **PHOTO—LOOKS PERFECT**

Here's how section of horizontal stabilizer in the tail of a DC-3 looked to the eye.



◀ **X-RAY—HIDDEN FAULTS**

See what X-ray inspection of the same section disclosed — trash, crack, misplaced rivet.

SPECIALIZED SERVICES . . . FACILITIES

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communication navigation control

now... COLLINS FOR business aircraft

Increased Services

Collins Reliability

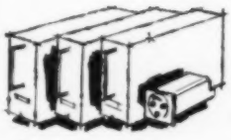
Now, an airborne electronic *System* designed exclusively for business aircraft. Services and high reliability of the "Airline Standard" are provided by Collins new space saving lightweight System. Weight is reduced greatly—the complete System shown below weighs only 108 pounds and uses only 3.9 cubic feet. Services are increased—for example: Collins ADF Receiver weighs only 15 pounds, includes *all* usable frequencies, and is designed to highest airline standards.

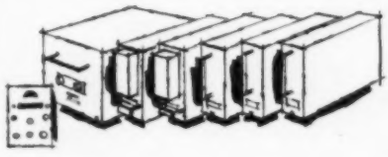
Each of these units is complete—with integral power supply. This System gives complete services of dual VHF Transmitter and Receiver, dual VOR, Automatic Direction Finder System, Marker Beacon Receiver, Glideslope Receiver and Integrated Flight System. An example of Collins new electronic System's space economy is the 17L-8 3 watt VHF Transmitter in a panel mounted 3" instrument case.

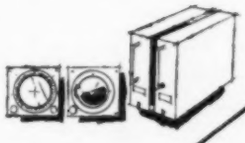
COMMUNICATION

NAVIGATION

CONTROL







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Phillips 66 LOOKS AHEAD with AMERICAN

A new concept of air travel time will result when American Airlines places its new Jet Airliners into operation in 1959. For example, a business man who is presently spending approximately 186 hours a year flying American from Los Angeles to New York and return once a month, will spend only a corresponding 108 hours a year when traveling on American Jet Airliners in 1959. His travel time will be more pleasant, too, thanks to the many new comfort and convenience features that will be incorporated into the new American Jet Airliner.

4½ HOURS - EAST BOUND *
PRESENT FLYING TIME 7 HOURS, 45 MIN.
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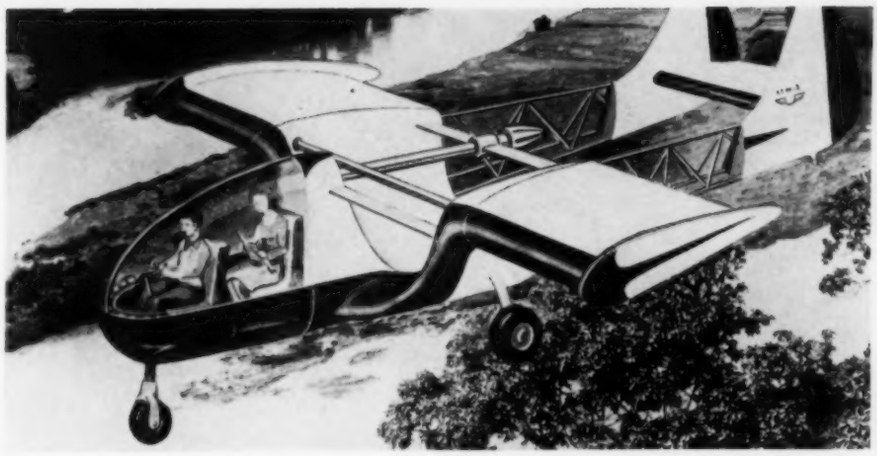
*approximate time.

● Today, Phillips 66 Aviation Gasoline gives dependable, efficient performance to American and other leading air lines, as well as to the military air services.

In step with the future, Phillips is a leading producer of *super performance* Jet Fuels for the latest designs in turbo-props and jets. And Phillips research continues to lead the way for development of fuels for the aircraft of tomorrow.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

LATEST CUSTER CHANNEL WING PROPOSAL is this CCW-2 2-place tandem with submerged 240-hp. engine shafted to a pusher propeller which would pull air through a half-barrel channel airfoil. W. R. Custer of Hagerstown, Maryland, claims it will land at 5 mph., take off over a 50-ft. obstacle in 300 ft., climb 4,000 fpm. and cruise 200 mph. He has licensed a new firm, Custer Channel Wing Manufacturing Corp., McAllen, Texas, headed by Lewis Leone, to produce and sell it. In previous years, Custer has flight tested a larger channel wing aircraft, the CCW-5.



AIR Report
Significant Trends and News

BEECHCRAFT TRAVEL AIR IS NEW NAME FOR THE BADGER, new 200-mph., 4-place small twin in $45,000 category which first flew in August and is now being certificated for commercial deliveries early in 1957. U. S. Air Force objected to "Badger" because it has given that name as a spotter's designation for a Russian jet bomber. For new name, Beech revived Travel Air from the 1925-30 era, when Walter H. Beech's top-performing biplanes dominated many air meets and performance competitions. His Travel Air Manufacturing Company of 1925 became world's largest producer of commercial planes in 1929. In 1932, he organized Beech Aircraft.

NEW 250-HP. VERSION OF 4-PLACE PIPER COMANCHE will be announced in December in $17,000 price range and with top speed exceeding 180 mph. Piper is also marketing 180-hp. Comanche in $13,000 price range with cruising speed above 160 mph. Details have been delayed until evaluation of a No. 2 prototype equipped with a new oleo-type tricycle landing gear, longer engine mount and other refinements over No. 1 test airplane.

NEW 400-HP. RATING FOR 6-CYLINDER CONTINENTAL GSO-526A which powers the 4-engine Cessna Model 620 may be available before the first production model is delivered. Engine's original rating was 320 hp., but this was raised to 350 hp. two months ago. New rating would give Cessna 620 total of 1,600 hp. at 15,000-lb. gross weight.

LYCOMING HAS 400-HP. 6-CYLINDER ENGINE, geared and supercharged, and with 540 cu. in. displacement.

DE HAVILLAND AIRCRAFT HAS STUDIED A TURBO-PROP VERSION OF THE 8-PLACE DOVE EXECUTIVE, now powered by two 380-hp. piston engines.

TEMCO TT-1 JET PRIMARY TRAINER, now being built for the Navy, has sufficient "stretch" designed into it to take a turbine twice as powerful as the 1,000-lb.-thrust Continental it now has. Export prospects appear good for Temco jet. Three Colombian Air Force and two Argentine Naval officers were checked out in it last month.

FLIGHT MAGAZINE

NOVEMBER, 1956 VOL. 45, No. 11

THIS MONTH'S COVER *pictures a new 1957 exterior trim for the fast-selling twin-engine Piper Apache. More than 700 of the 4-place Apaches are now flying. Apache is powered by two 4-cylinder 150-hp. Lycoming engines driving feathering, constant-speed Hartzell propellers and, with optional auxiliary tanks for 108-gal capacity, has a 1,200-mile range. Performance includes 170-mph. cruising speed at 6,000 ft. using 75 per cent horsepower.* —(Piper Photo.)

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, *Consultant;* P. O. BOX 750 (2700 N. Haskell Ave.), Dallas, Texas—Telephone TAylor 3-6191.

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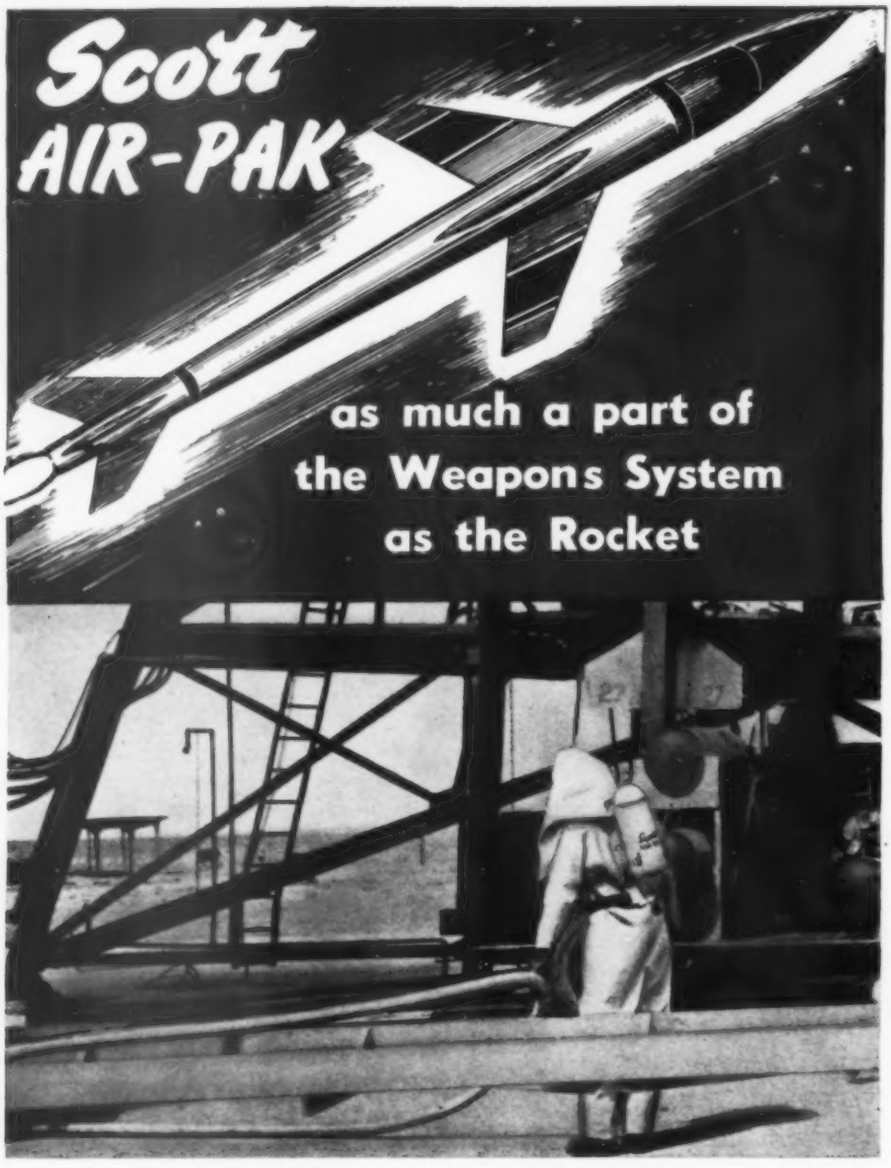

Fireman makes ready for an acid fueling standby at Holloman Air Force Base, N. M. Note clothing which is acidproof. William B. Oney, Base fire chief, says, "We must have a breathing apparatus which is dependable, and Scott Air-Pak sure fills the bill."
The American City Magazine

To successfully launch one rocket, hundreds of minute details must be carefully coordinated. Each part must operate dependably to insure unfailing operation of the whole!

And so it is with the Scott Air-Pak. In any one of its several configurations, it gives that sure, positive breathing protection to men that perform the hazardous duties associated with nuclear weapons, guided missiles or man-made satellites. Whether it's fueling a rocket or standing by to fight a fire, you can depend on the Scott Air-Pak to give service beyond the call of duty.

SINCE 1932 Scott FOR SAFETY—FOR SERVICE

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Airmen's Calendar

Nov. 14-15—AIA Export Conference, Miami Beach, Fla.

Nov. 16-17—Air Mail Pioneer Reunion, Eastern Division, Ambassador Hotel, Washington, D. C.

Nov. 25-27—28th Annual ADMA Meeting, Drake Hotel, Chicago.

Nov. 26-27—Jet Age Conference, San Angelo, Texas.

CAA CERTIFICATION OF VERTOL H-21 HELICOPTER FOR COMMERCIAL SALES is being pushed to completion, with flight test phase conducted in Canada. Vertol is launching energetic sales campaign abroad.

AERO DESIGN HAS PHOTOGRAPHIC VERSION OF SUPER 680 AERO COMMANDER with hydraulically-operated camera doors in cabin floor.

GOOD SALES PROSPECTS FOR 3-PLACE, 150-HP. SKIMMER AMPHIBIAN on Gulf Coast have been reported by Bill Eberhart of Louisiana Aircraft, Baton Rouge, distributor, following 25 hours of demonstrations in the area. Gilley Aviation at Lafayette, float operator, ordered the first Skimmer from Eberhart, and will be a dealer. All-metal amphibian is priced at $15,750 by Colonial Aircraft Corp., Sanford, Maine, which is in production.

BRITISH OVERSEAS AIRWAYS CORPORATION HAS BOUGHT 15 BOEING 707 JET AIRLINERS and spare parts costing $123,000,000, of which $98,000,000 will be in dollars

(Continued on page 48)

FIRST SOUTH AMERICAN MOONEY MARK 20 was delivered recently across the Andes to Buenos Aires by Bill West, shown receiving the keys from Mooney Sales Manager Norm Hoffman.
—(Mooney Photo.)

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Joins hands with

DALLAS AERO SERVICE

To Provide

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Complete Lycoming Engine sales, service, overhaul and installation is now available to the users of this type engine through the combined services of Brown Aero Corp. and Dallas Aero Service. Brown Aero Corp., distributors for the famed Aero COMMANDER airplane, is now an authorized Distributor in the Southwest for Lycoming.

Dallas Aero Service, a firm with more than 30 years experience in aviation, will work closely with Brown Aero Corp. to provide the additional services of engine exchange, service and installation. Both organizations are located in the Dallas Aero installation on the Northwest side of Love Field in Dallas — for your further convenience.

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How to be SURE your EGT and RPM Systems are RIGHT... Check with the B & H Instrument

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Tests EGT System Accuracy to ±4°C at Test Temperature

(functionally, without running the engine)

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This NEW "J" Model *JETCAL* contains NEW . . . 1) Takcal, 2) "Ta'Pot" Potentiometer, 3) Ruggedized Light-Beam Galvos, 4) Test Circuits.

T-34 Turbo-Prop Engine Pratt & Whitney Aircraft

ANALYZES JET ENGINES 10 WAYS:

1) The JETCAL Analyzer *functionally* tests EGT thermocouple circuit of a jet aircraft or pilotless aircraft missile for error *without running the engine or disconnecting any wiring.* GUARANTEED ACCURACY is ±4°C. at engine test temperature.
2) Checks individual thermocouples "on the bench" before placement in parallel harness.
3) Checks thermocouples within the harness for continuity.
4) Checks thermocouples *and* paralleling harness for accuracy.
5) Checks resistance of the EGT circuit *without the EGT indicator.*
6) Checks insulation of the EGT circuit for shorts to ground and for shorts between leads.
7) Checks EGT Indicators (in or out of the aircraft).
8) Checks EGT system with engine removed from aircraft (in production line or overhaul shop).
9) Checks aircraft TACHOMETER system accuracy from 0 to 110% RPM with guaranteed accuracy to within ±0.1% in the operating range.
10) JETCAL Analyzer enables engine adjustment to proper relationship between engine temperature and engine RPM for maximum thrust and efficiency during engine run (Tabbing or Micing). ALSO *functionally* checks aircraft Over-Heat Detectors and Wing Anti-Ice Systems (thermal switch and continuous wire) by using TEMPCAL Probes. Rapid heat rise . . . 3 minutes to 800°F! Fast cycling time of thermal switches . . . 4 to 5 complete cycles per minute for bench checking in production.

Two of the most important factors that affect jet engine life, efficiency, and safe operation are *Exhaust Gas Temperature (EGT)* and *Engine Speed (RPM).* Excess heat will reduce "bucket" life as much as 50% and low EGT materially reduces efficiency and thrust. Any of such conditions will make operation of the aircraft both costly and dangerous. The *JETCAL Analyzer* predetermines accuracy of the EGT and (interrelatedly) Tachometer systems and isolates errors if they exist.

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Continental Shares in Another Aviation "First"

. . . CESSNA MODEL 620, WORLD'S PIONEER PRESSURIZED FOUR-ENGINE EXECUTIVE TRANSPORT

Two organizations long noted for their contributions to flying have joined hands to achieve another major aviation "first," Cessna's Model 620, now flying. . . . The Cessna Model 620, world pioneer of its type—first pressurized four-engine airplane built for the corporate market—unites several qualities which users of executive aircraft have long desired. Its four Continental Red Seal GSO526-A engines provide four-engine safety, with the important plus of Continental dependability, economy and service backing. It is pressurized for altitudes up to its four-engine service ceiling of 27,500 feet, and air-conditioned for comfort aloft and on the ground. . . . Flights climaxing three years' work on this advanced airplane have fully borne out its builders' highest expectations. The Cessna 620 now takes its place as the latest on the long roster of fine utility aircraft using dependable Continental power.

Continental Motors Corporation

AIRCRAFT ENGINE DIVISION

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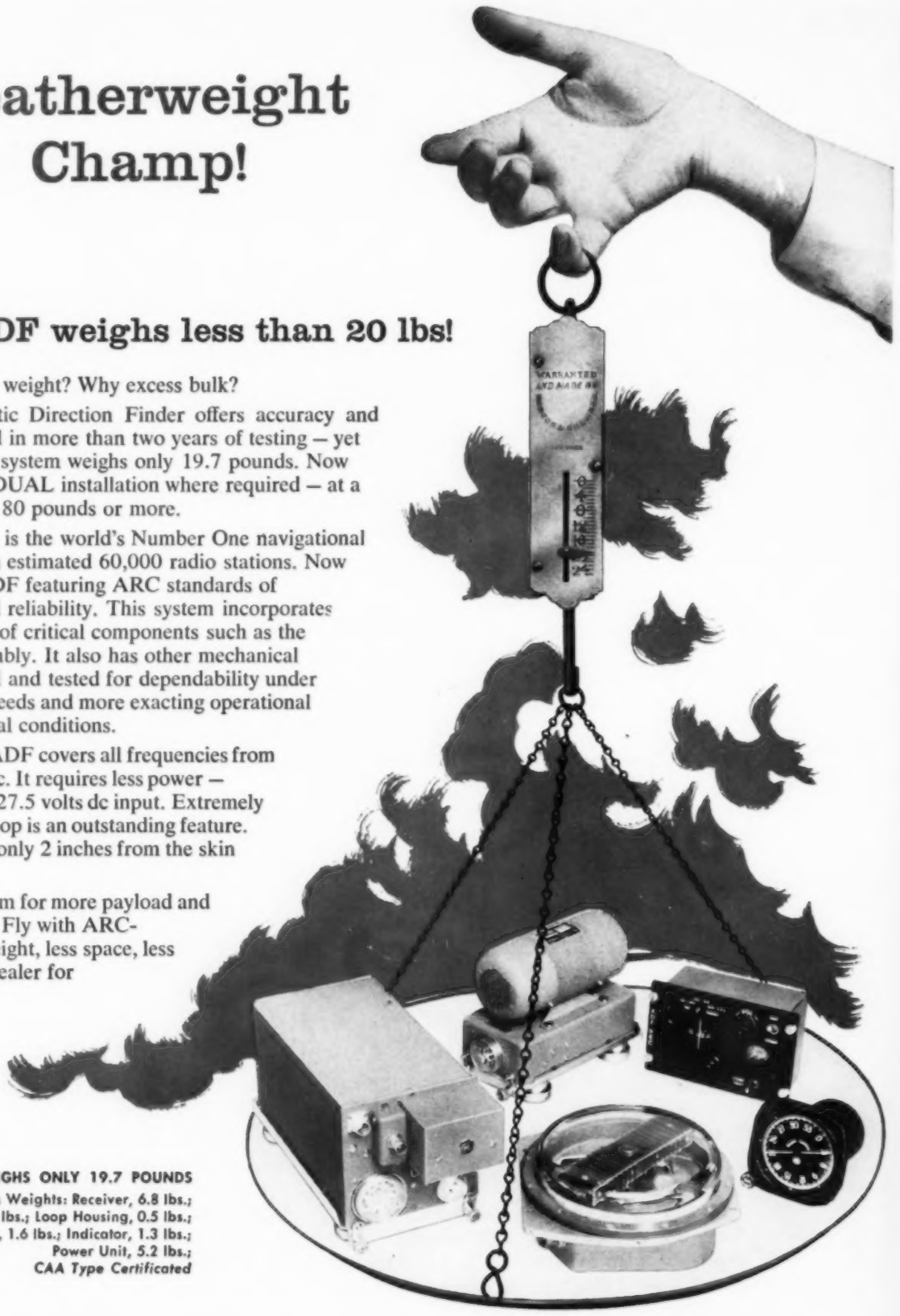
Featherweight Champ!



ARC's ADF weighs less than 20 lbs!

Why carry dead weight? Why excess bulk?

This Automatic Direction Finder offers accuracy and reliability proved in more than two years of testing – yet the entire 5-unit system weighs only 19.7 pounds. Now you can have a DUAL installation where required – at a weight saving of 80 pounds or more.

The ADF still is the world's Number One navigational aid, usable on an estimated 60,000 radio stations. Now you can have ADF featuring ARC standards of performance and reliability. This system incorporates hermetic sealing of critical components such as the entire loop assembly. It also has other mechanical features designed and tested for dependability under today's higher speeds and more exacting operational and environmental conditions.

The Type 21 ADF covers all frequencies from 190 kc to 1750 kc. It requires less power – only 2.8 amps at 27.5 volts dc input. Extremely low drag of the loop is an outstanding feature. Housing extends only 2 inches from the skin of the aircraft.

Now make room for more payload and other equipment. Fly with ARC-reliability, less weight, less space, less drag. Ask your dealer for complete details.

TYPE 21 ADF WEIGHS ONLY 19.7 POUNDS
Component Units Weights: Receiver, 6.8 lbs.; Loop, 4.3 lbs.; Loop Housing, 0.5 lbs.; Control Unit, 1.6 lbs.; Indicator, 1.3 lbs.; Power Unit, 5.2 lbs.;
CAA Type Certificated

Dependable Airborne Electronic Equipment Since 1928

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Omni/ILS Receivers • Course Directors • UHF and VHF Receivers and Transmitters LF Receivers and Loop Direction Finders • 10-Channel Isolation Amplifiers • 8-Watt Audio Amplifiers • Interphone Amplifiers • Omnirange Signal Generators and Standard Course Checkers • 900-2100 Mc Signal Generators

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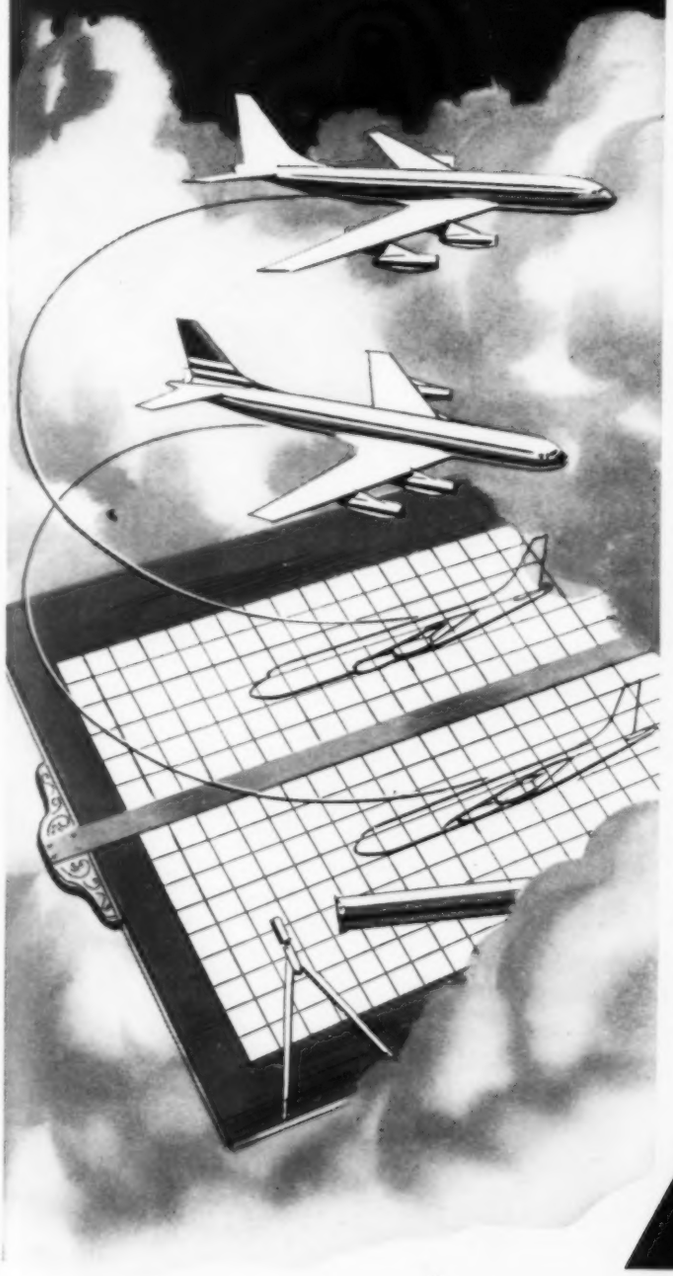

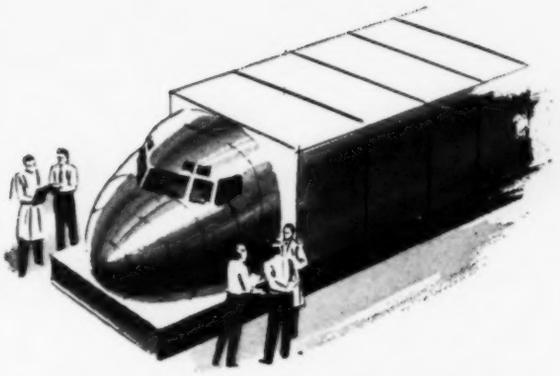

with Electronic Flight SIMULATORS built by Curtiss-Wright

Crews for tomorrow's jetliners will have thousands of hours of jet experience before the first Boeing 707 or Douglas DC-8 enters service. They will "fly" the jets right off the drawing board, in electronic Flight Simulators built by Curtiss-Wright.

The Simulator behaves exactly like the prototype aircraft – even uses an identical crew compartment. All controls and instruments function as they do in actual flight. Crews rehearse world air routes under varied weather and navigational conditions. A "trouble console" conditions the pilot's reflexes against all possible emergencies. Simulators built by Curtiss-Wright have resulted in savings of millions of dollars, thousands of manhours yearly for the world's leading airlines.

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ELECTRONICS DIVISION
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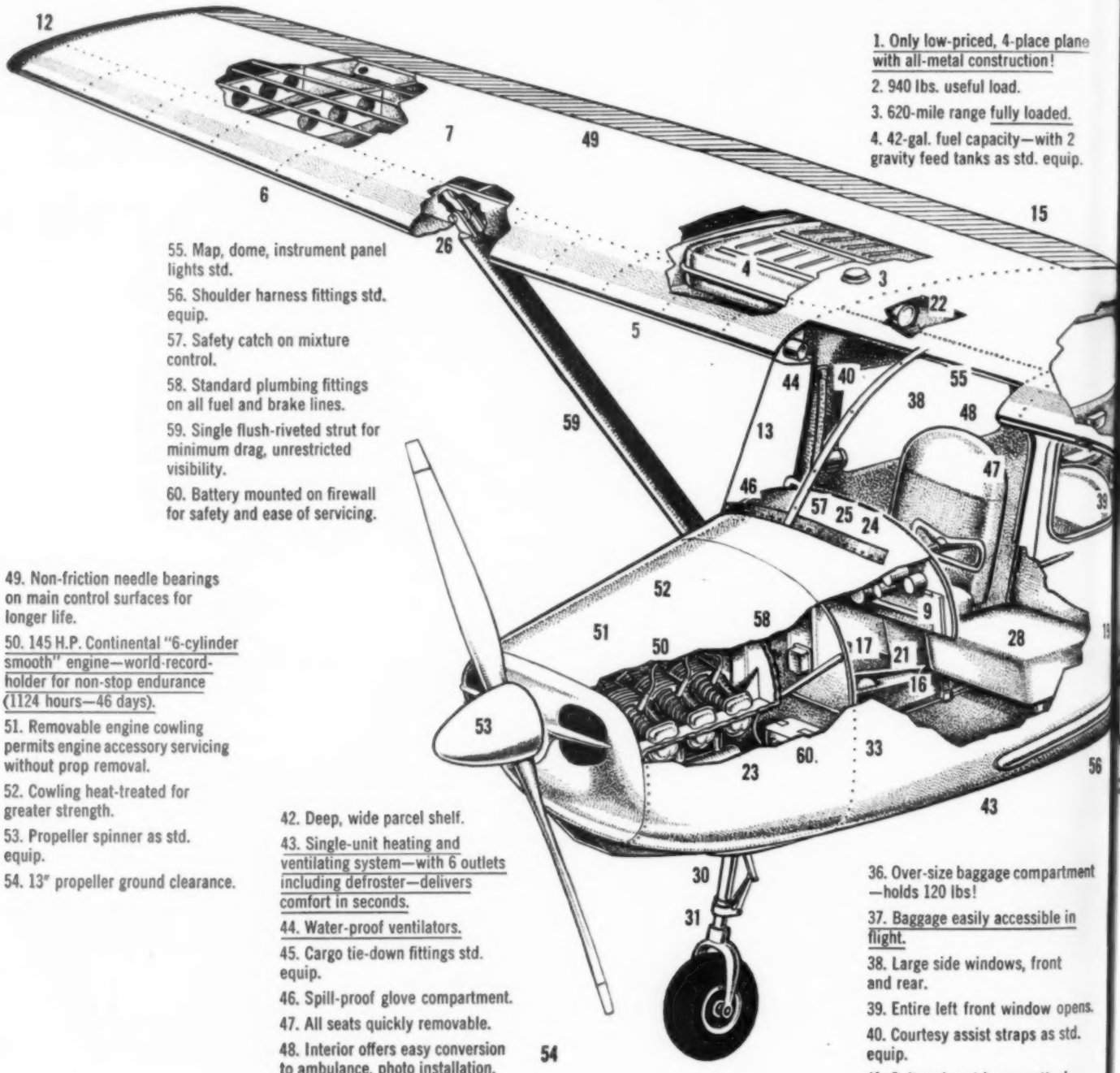
BIGGEST PLANE IN ITS CLASS! . . . 57'S BIGGEST VALUE!

The big new Cessna 172 with 60 extra features found in no other low-priced airplane . . .



1. Only low-priced, 4-place plane with all-metal construction!
2. 940 lbs. useful load.
3. 620-mile range fully loaded.
4. 42-gal. fuel capacity—with 2 gravity feed tanks as std. equip.

55. Map, dome, instrument panel lights std.
56. Shoulder harness fittings std. equip.
57. Safety catch on mixture control.
58. Standard plumbing fittings on all fuel and brake lines.
59. Single flush-riveted strut for minimum drag, unrestricted visibility.
60. Battery mounted on firewall for safety and ease of servicing.

49. Non-friction needle bearings on main control surfaces for longer life.
50. 145 H.P. Continental "6-cylinder smooth" engine—world-record-holder for non-stop endurance (1124 hours—46 days).
51. Removable engine cowling permits engine accessory servicing without prop removal.
52. Cowling heat-treated for greater strength.
53. Propeller spinner as std. equip.
54. 13" propeller ground clearance.

42. Deep, wide parcel shelf.
43. Single-unit heating and ventilating system—with 6 outlets including defroster—delivers comfort in seconds.
44. Water-proof ventilators.
45. Cargo tie-down fittings std. equip.
46. Spill-proof glove compartment.
47. All seats quickly removable.
48. Interior offers easy conversion to ambulance, photo installation.

36. Over-size baggage compartment—holds 120 lbs!
37. Baggage easily accessible in flight.
38. Large side windows, front and rear.
39. Entire left front window opens.
40. Courtesy assist straps as std. equip.
41. Suit and coat hanger attach. std. equip.

4 GREAT CESSNAS 172 180 182 310 THE COMPLETE AIRFLE

5. 36′ wing span provides unsurpassed stability.

6. Tapered high wing—aerodynamically cleaner for smoother flight.

7. 174 sq. ft. of wing area contributes to the 172's unique stability.

8. 25′ over-all length also adds stability.

9. Shock-mounted instrument panel.

10. Aerodynamically counter-balanced control surfaces with full individual 3-way controls!

11. Spacious 41″ wide cabin—long and high, with ample leg room both front and rear.

12. Navigation lights as std. equip.

13. Excellent "over-the-nose" visibility—through the big 1200 sq. in. full-floating windshield.

14. Landing light wiring and brackets as std. equip.

15. 2926 sq. in. Para-Lift flaps—over twice normal size—give shorter take-offs, slower approaches, far greater stability!

16. 4 flap-position settings—for greater range of control.

17. Flap-up lock prevents damage.

18. Friction-free oilite pulley bearings for longer life and finger-tip control!

19. 2 yard-wide cabin doors give easy access to any seat; pilot may enter first or last.

20. Larger jet-type tail group for unequalled ease of control.

21. Fuel selector handle accessible to both front seats.

22. Separate fuel gauges for each tank.

23. Safety-starter—will not operate without master switch in "on" position.

24. Two-position landing light switch.

25. Stall warning indicator as std. equip.

26. 4 tie-down rings as std. equip.

27. Full cantilever empennage—no external brace rods, bell cranks, or cables.

28. Time-proved "no-sag" seat construction, both front and rear.

29. Cessna's famous wide-span "Land-O-Matic" landing gear, engineered for ground stability, gives easier, safer landings and take-offs.

30. Fully steerable nose wheel coupled with individual toe brakes allows "pivotal" turning.

31. In-flight lock on nose wheel cuts drag, boosts speed.

32. Goodyear wheels and brakes—long life, low maintenance.

33. Individual toe-operation of brakes assures more positive handling.

34. Exclusive adjustable rear seat back.

35. Rear seat arm rests as std. equip.

No wonder the Cessna 172 has quickly become the world's largest-selling airplane! Let your Cessna dealer show you all its great features. Test them yourself — in flight, compare the Cessna 172 for '57 against others in its class, see how you actually get a bigger and better airplane for your money! $8,975 f.a.f. Wichita.

Fly a 1957 Cessna 172 at your dealer's soon (Yellow Pages of telephone book) or write CESSNA AIRCRAFT CO., Dept. FM-1, WICHITA, KANSAS.

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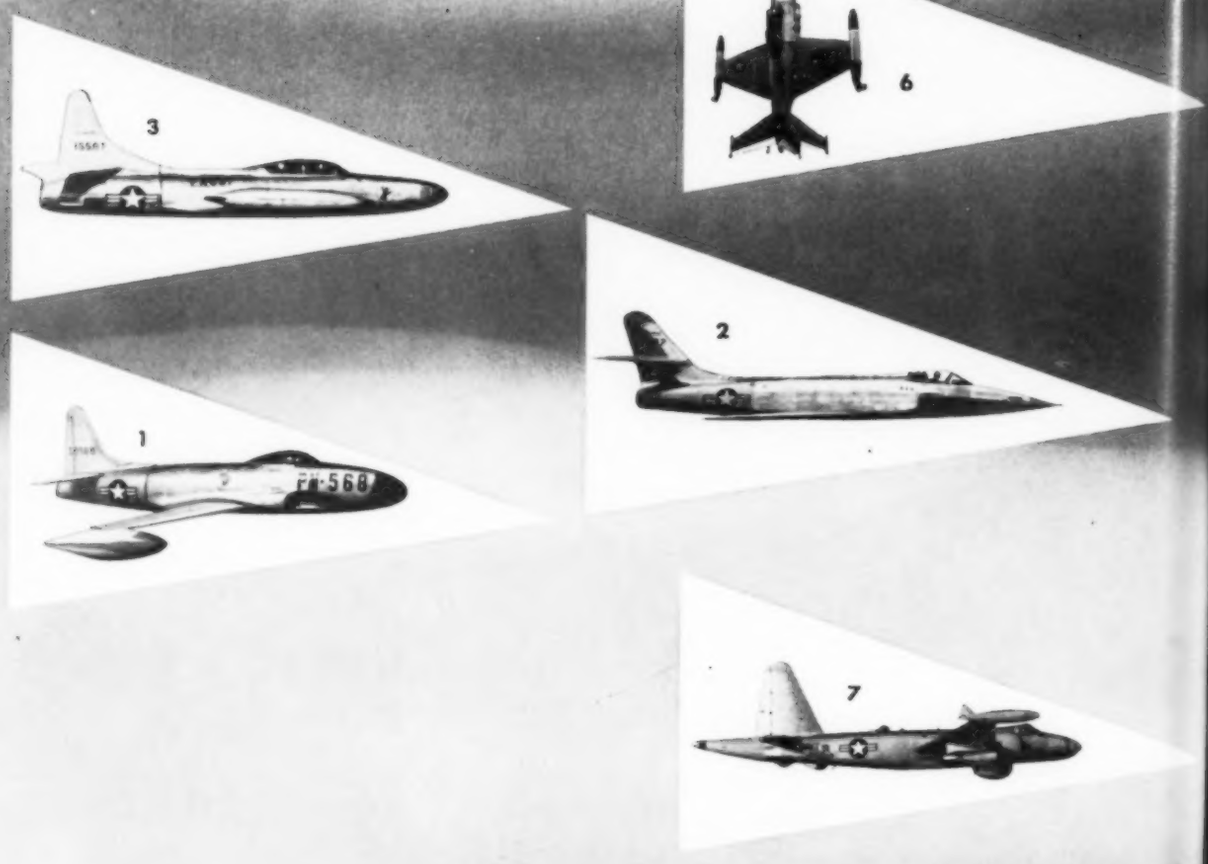

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The LOCKHEED ELECTRA's *heritage of jet-powered leadership—gained from the design and manufacture of over 8,000 jet-powered aircraft of the widely varying types shown here—endows this pace-setting plane-of-tomorrow with qualities that will give you a thrilling, new way to travel in the jet air age.*

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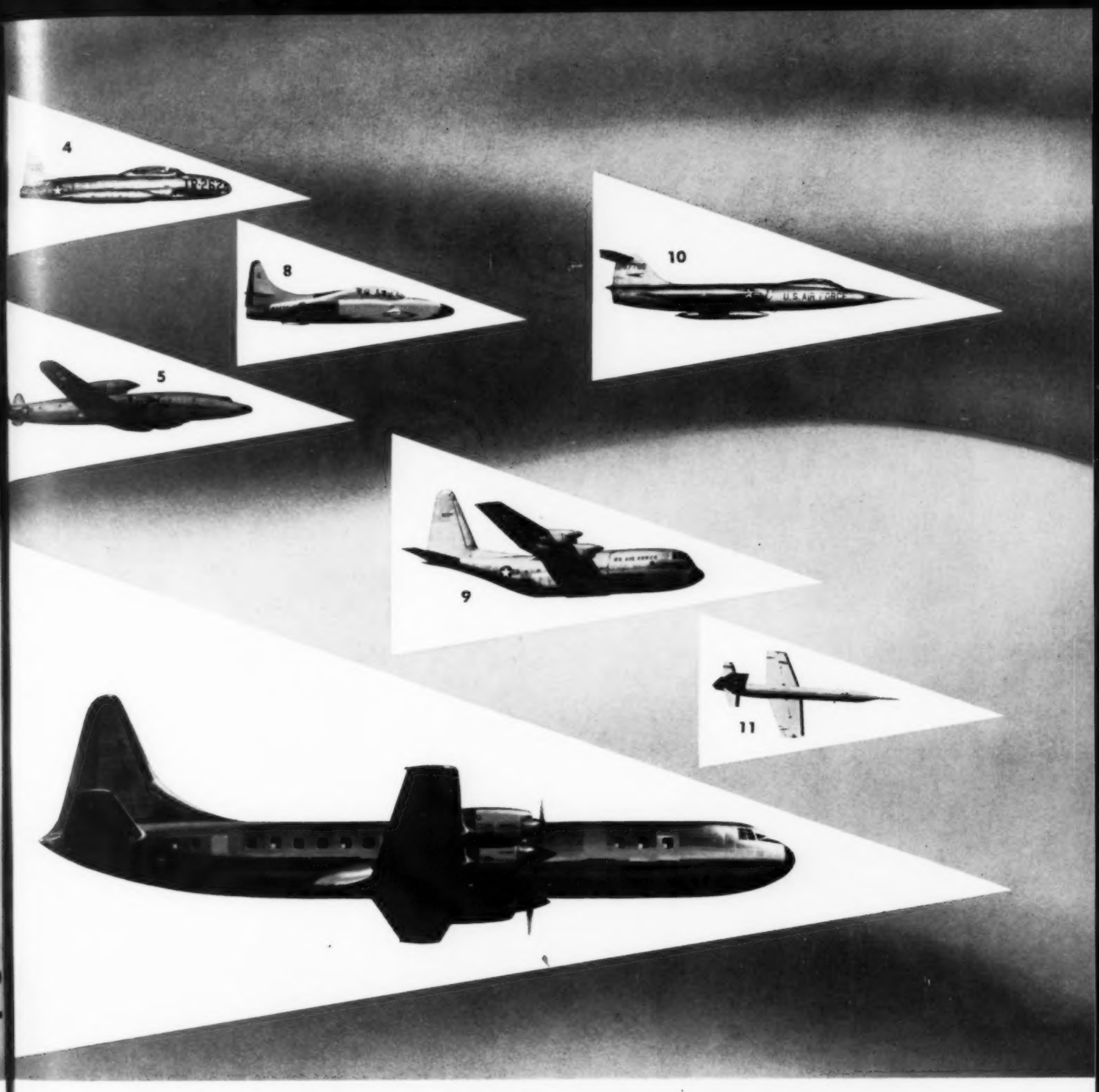

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8. JET T2V-1 SeaStar Trainer—"World's Safest," first production plane utilizing Boundary Layer Control for slow, safe landings and takeoffs on USN carriers.

9. PROPJET C-130 Hercules—the versatile new go-anywhere, haul-anything "strongman" of the USAF that led America into a new era of swift, low-cost movement of heavy cargo.

10. JET F-104 Starfighter—World's Fastest Jet Fighter . . . "America's Missile With a Man in It," capable of overtaking and destroying any aircraft.

11. RAMJET X-7 Missile, designed and built by Lockheed's Missile Systems Division, is one of a family of supersonic vehicles testing and developing air-breathing ramjet engines.

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Dear Lynn: Thought you'd like this Texas-Size postcard of the $4,000,000 Texas-Size layout Southwest Airmotive is building for business airplanes. Much of it will be ready in '57 in time for SAC's 25th Anniversary. Wish I could join you as you putter around in your gingham apron cookin' that Thanksgiving turkey. I'll bet it takes a lot of drumsticks for my 23-yr.-old, 128 lb., 5'8", blonde, blue-eyed Texas-Size chefess! Love, *Daddy*

SOUTHWEST AIRMOTIVE CO. • LOVE FIELD • DALLAS, TEXAS

Just among ourselves

Small Town Airports

WE recently came face to face with a typical airport squabble in which several prominent businessmen of a medium sized town are fighting a plan to modernize and improve the local municipal field. Their attitude is: "Why should we spend taxpayers' money on an airport for the benefit of a dozen or so 'rich' plane owners"?

While it is difficult to comprehend such an attitude in A.D. 1956, the fact remains that foes to aviation progress are still legion, that ignorance and prejudice are factors to contend with. Convincing evidence of an airport's intrinsic value to a community is not getting around. While all airmen and most people associated with recent aviation development fully realize that an adequate, well-managed airport makes the cash registers ring up and down Main Street and like highways, railroads and waterways, brings business into the town, important segments of the general public simply don't recognize such facts.

In all the studies and projections of what kind of facilities aviation will need in the years to come, practically all attention is being paid to air space and communication problems with very little thought being given to the airport situation, except perhaps for the growing congestion at the busy terminals.

We believe that unless more state aviation agencies get into the airport development picture as have such states as Illinois, Alabama and Pennsylvania, hope for a well-balanced national airport program is going down the drain. There can be no sustained growth of scheduled and non-scheduled civil aviation unless our plans, projections and facilities are on an all-inclusive basis. Concentration on big airways systems and on big terminal type airports alone is as silly and unrealistic as a road building program that puts total emphasis on city streets and a few super-highways. It's the fan-out to all parts of the nation that really counts no matter what system of transportation you're dealing with.

Dry up aviation development, i.e. airports, in hundreds of small and medium size communities and you can rest assured that the ripple will turn into a wave and be felt all down the line. That's why small-town airports, both new and those that need improvements, are everybody's business, even though the present administration refuses to recognize the fact.

Heroism at 30,000 Feet

THE National Advisory Committee for Aeronautics has awarded Distinguished Service Medals to two employes of the NACA High-speed Flight Station, Edwards, California, "for outstanding bravery beyond the call of duty" following a high-altitude explosion in the rocket-propelled Bell X-1A airplane. Other honors are due to be given to seven more employes and one Air Force escort pilot on duty during the near-tragedy that occurred high over the California desert in August of 1955.

John W. Moise and Charles W. Littleton are the recipients of the DSM. They are credited with taking the immediate action which may well have saved the life of X-1A Pilot Joe Walker. Just before the research plane was to be dropped from the belly of a B-29 at 31,000 feet, an explosion occurred, rendering Walker unconscious. Moise and Littleton, ignoring the hazard of further explosions, opened the X-1A canopy from the precarious B-29 bomb bay and removed the unconscious pilot. After partial recovery, Walker returned to the research plane and tried to dump the explosive fuels remaining in its tanks. Major Arthur Murray, Air Force pilot flying the jet "chase" plane, remained "at his post" and gave valuable assistance to the NACA crew even though his plane was damaged by debris from the explosion.

Such is the calibre of American pilots and crews dealing daily with tremendous unknowns and awful risks in the supersonic research programs. There is no adequate reward or suitable citation for such instances of heroism and personal bravery, no medal or recompense or expression of gratitude, to the living or the dead, that can ever compensate that hardy band of test pilots and technicians trying to find the answers at speeds and altitudes and temperatures that must and will be conquered.

The Air Force Stands Indicted

ON the pleasant Indian summer afternoon of October 24 a Cessna 170 was cruising along with a family of five aboard, including an infant, high above Midland, Texas. A U. S. Air Force two-place T-33 jet trainer collided with the 170, scattering bodies and debris over a city residential block. Fortunately the fatalities were limited to the seven occupants of the two craft.

Regardless of official explanations or alibis, if any, from the U. S. Air Force, local jet training operations have no business on or near the airways, or over the city of Midland. This tragic accident can not be brushed aside with the usual easy-going irresponsible statements such as "air space congestion" or "outdated air traffic control facilities". This accident is little short of murder and suicide simply because jet training operations are taking place over built-up areas and on or near the airways.

Public and civil aviation indignation over this catastrophe must and will bring the Air Force training command to account for this horrible example of shocking irresponsibility.

The tragic aspects of the accident are matched in magnitude by the ire of civilian airmen everywhere.

★ ★ ★

The 1956 Super 18 Beechcraft carries eight persons in luxurious travel comfort. Its superbly appointed, custom-tailored cabin — its big rugged frame — its powerful engines — and its unexcelled performance and utility are the result of the inspired craftsmanship which has produced more than 10,000 twin-engined BEECHCRAFT airplanes — world-renowned for their superiority of design and construction.

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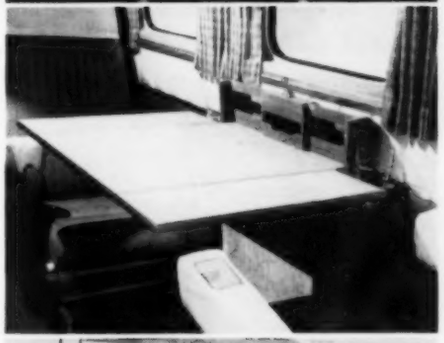

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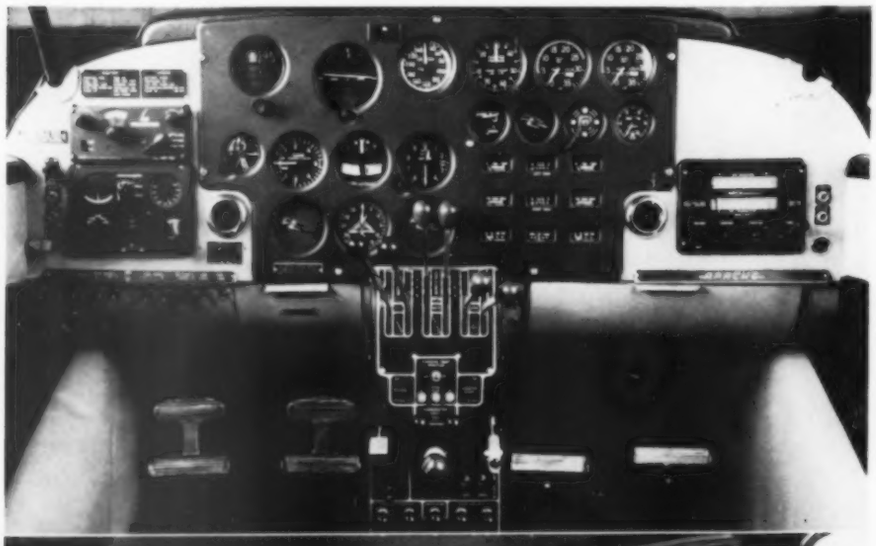
New 1957 paint trim distinguishes the 170-mph. 4-place Apache, powered by two 150-hp., 4-cylinder Lycoming engines. The new instrument panel and interior trim are pictured below. This panel is production-line installed on Custom and Super Custom models. Note pedestal's convenient grouping of controls for power, propellers, mixture, carburetor heat, landing gear, flaps, cabin conditioning, and auxiliary hand pump. Over 700 Apaches are now flying.
—(Piper Photos.)



Piper Models For 1957

NEW 1957 versions of Piper Aircraft Corporation's line of 4 basic models of business planes, including the aircraft industry's only new all-metal 4-place design to make its appearance in recent years — the 180-hp. Comanche — were introduced at the firm's annual distributor sales meeting in Lock Haven, Pennsylvania, last month. A 250-hp. version of the Comanche will be announced in December.

Piper has increased its prices across the board for 1957 models, the Super Cub being $500 to $600 higher in six versions, the Tri-Pacer $635 higher in three versions and the Apache, in three versions, being $990 to $1,280 higher. Here are the new 1957 prices:

Super Cub 90 hp. Standard, $5,295; Deluxe, $5,920.

Super Cub 150 hp. Standard, $6,595; Deluxe, $7,020.

Super Cub agricultural Standard, $6,780; Deluxe, $7,205.

Tri-Pacer 150 hp. Standard, $7,830; Custom, $8,430; Super Custom, $9,430.

Apache 300 hp. Standard, $34,990; Custom, $37,780; Super Custom, $39,590.

Twelve-month Piper airplane deliveries ended October 1, 1956, were valued at $31,000,000, exceeding the factory goal by $1,000,000, and the 1957 goal has been set at $36,000,000. These values are in retail prices and

show tremendous gains as compared to $20,500,000 in retail billings for the year of 1955 and only $4,300,000 for 1950.

But the new 4-place Comanche still was not described in detail, although first deliveries will begin next April. Specifics for the Comanche must await flight evaluation of a No. 2 test airplane, which began flying late in October. It incorporates several changes and improvements, including a new oleo-type hydraulic landing gear which replaced the rubber-shock-strut retractable gear on the prototype, and a slightly longer engine mount.

However, Sales Manager J. W. Miller did emphasize to his distributors that the Comanche, which is powered by a 4-cylinder, 180-hp. Lycoming engine equipped with a constant-speed, all-metal, controllable Hartzell propeller, "will outperform anything in its price class." The Comanche apparently has performance in the 160-mph. category, with a cabin said to be wider than that of the Bonanza.

Miller also revealed for the first time that two versions of the Comanche will be marketed, the 180-hp. model and a new 250-hp. model, details of which will not be released until December. It is believed performance of the 250-hp. version will top the 180-mph. mark. It was indicated that the 250-hp. version will be priced in the $17,000 category, between the Comanche 180 and the Bonanza.

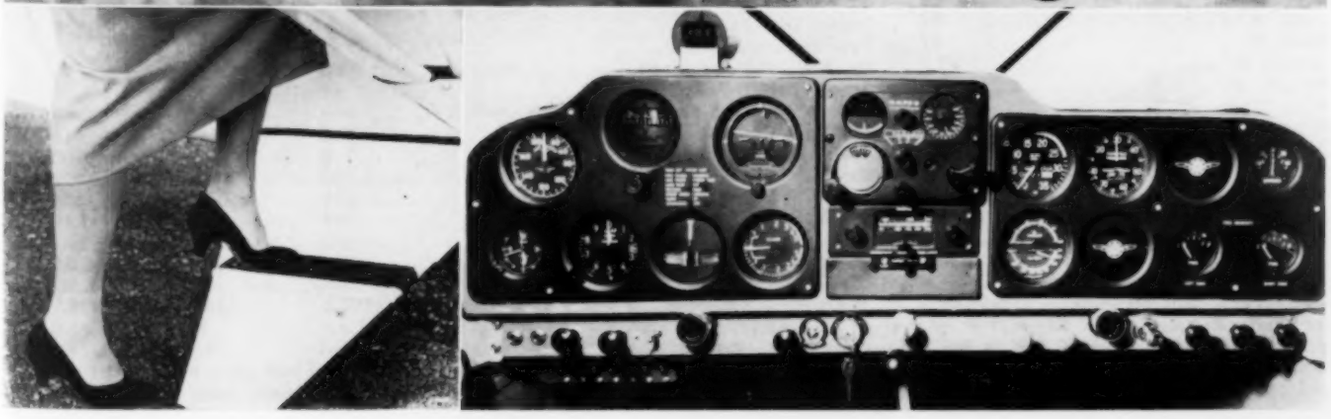
New refinements in the 1957 twin-engine Apache include higher capacity carburetor heaters plus installation of carburetor air temperature indicators as standard. For visual setting of throttles, propeller and mixture controls, an innovation for twins is Piper's new quadrant markings which provide easy-to-read graduated scales between the raceways, with numbers from 1 to 5. This permits easy, quick positioning of the controls to desired settings.

The Apache, powered by two 150-hp. Lycoming 0-320 engines with full-feathering, constant-speed Hartzell propellers, has a 170-mph. cruising speed on 75% horsepower at 6,000 ft., with the Standard and Custom versions having 72-gal. fuel capacity and the Super Custom having 108-gal. fuel capacity, the latter being sufficient for 1,200 miles. Dual generators and dual vacuum pumps are standard in the Super Custom model. The Custom model offers factory installed Lear ADF, Narco Omnigator combining VHF transmitter, receiver, 75-mc marker beacon and ILS localizer function, plus a separate Narco 27-channel transceiver.

Standard Apache seating is for 4 persons but a 5-place version is available by replacing the two-place rear seat with three individual seats on tracks, one of these occupying the left side of the baggage compartment, which is fully upholstered and becomes an integral part of the cabin with removal of the deep hat shelf.

Three color combinations instead of two as last year, available this year include a Daytona white cabin top and black nose and nacelles as standard, with a choice of Pasadena rose, Cadillac red or Key West blue for the main color. Seats and cabin side walls are upholstered in genuine leather of rose, red or blue, the leather being matched with black nylon upholstery material piped in silver and gray worsted headlining. Additional soundproofing and a rubber-backed floor mat improve cabin quietness.

The 1957 4-place, 150-hp., 130-mph. Tri-Pacer's new trim, new entry step and efficiently-grouped instrument panel are pictured below. The new step facilitates entry to the front seat on the right. Note flight instruments including gyro group on left-hand panel, radio on center panel and engine instruments on right. —(Piper Photos.)



Familiar 2-place, tandem Super Cub is available in six 1957 versions, including two 90-hp. models, two 150-hp. versions and two agricultural versions. Pictured here is the PA-18-A sprayer, with 110-gal. chemical tank and "floating" spray booms hinged to swing back if they strike a ground object. Duster version has 18-cu. ft. hopper and 1,010-lb. useful load, with wind-driven double agitator for uniform flow of dust to 6-ft.-wide venturi dispersal unit providing working swath of 50 ft. and maximum swath of 70 ft. —(Piper Photo.)

Offered in Standard, Custom and Super Custom models, the 4-place Tri-Pacer, powered by the 150-hp. Lycoming engine, features the same 1957 colors as the Apache. Cruising speed of the Tri-Pacer is 132 mph. using 75% horsepower at 7,000 ft. and standard fuel capacity of 36 gals. for over 500-mile range can be increased with an optional 8-gal. auxiliary tank under the rear seat to extend range beyond 600 miles.

The Super Custom model, which has represented nearly two-thirds of all Tri-Pacer sales in recent years, includes full instrumentation with all gyro and other flight instruments grouped in a panel directly in front of the pilot on the left. Radio is grouped in the center, with engine instruments, featuring Narco Superhomer with multi-channel transmitter, VHF receiver and VOR navigation system plus low-frequency range and standard broadcast receiver. Two blanks for extra equipment are located on the right. A fixed homing loop aft of the cabin section permits homing on range or broadcast stations.

Most noticeable exterior change on the Tri-Pacer is the installation of a small but generous step on the right landing gear leg, making it easier to enter or leave the front cabin door.

★ ★ ★

1957 Piper Apache Twin
Factory Data

Top Spd., mph.	180
Cr. Spd., 75% hp., 6,000 ft., mph.	170
Stall Spd., mph.	52
Take-off Run, ft.	900
Landing Roll, ft.	670
Rate of Climb, fpm.	1,350
SE Rate of Climb, fpm.	240
Abs. Clng., ft.	20,000
SE Abs. Clng., ft.	6,750
Fuel Cap., gals.	72
Tot. Fuel Cap. Avlbl., gals.	108
Cr. Range (max. spd. at 6,000 ft., std. fuel), mi.	660
Max. Range (with 108-gal. fuel cap.), mi.	1,260
Engines: Two Lycoming 0-320, rated at 150 hp. each at 2,700 rpm.	
Gross Wt., lbs.	3,500
Empty Wt., lbs.	2,180
Useful Ld., lbs.	1,320
Bag. Cap., lbs.	200
Bag. Space, cu. ft.	25
Cargo Space (rear seat out), cu. ft.	80
Span, ft.	37
Length, ft.	27.1
Height, ft.	9.5
Wing Area, sq. ft.	204
Wing Ldng., lbs. sq. ft.	17.2
Pow. Ldng., lbs. hp.	11.6
Wheel Base, ft.	7.5
Wheel Tread, ft.	11

NOTES: *Useful load is 1,290 lbs. for 5-passenger version and 1,302 lbs. for long-range version having 108-gal. fuel capacity, these figures allowing for additional weight of 5-seat installation or auxiliary fuel cells. Performance is at gross weight and sea level unless noted and is for a standard aircraft flown under CAA standard conditions.

1957 Piper Tri-Pacer
Factory Data

Engine: Lycoming 0-320 rated at 150 hp. at 2,700 rpm.	
Gross Wt., lbs.	2,000
Empty Wt., lbs.	1,100
Useful Ld., lbs.	900
Span, ft.	29.3
Length, ft.	20.6
Height, ft.	8.3
Wing Area, sq. ft.	147.5
Wing Ldng., lbs. sq. ft.	13.5
Pow. Ldng., lbs. hp.	13.3
Bag. Cap., lbs.	100
Fuel Cap., gals.	36
Top Spd., mph.	139
Cr. Spd., 75% hp., 7,000 ft., mph.	132
Fuel Cons., 75% hp., gph.	9.8
Range, mi.	550
Stall Spd., mph.	49
Rate of Climb, fpm.	724
Clng., ft.	17,500
Svc. Clng., ft.	15,000

NOTES: Performance for gross weight at sea level unless noted and at CAA standard conditions.

1957 Piper Super Cub
Factory Data

	Model 95	Model 150	Ag Model With Eqpt.
Horsepower	90	150	150
Gr. Wt., lbs.	1,500	1,750	2,070
Empty Wt., lbs.	800	930	1,060
Useful Ld., lbs.	700	820	1,010
Top Spd., mph.	112	130	105
Cr. Spd., 75% hp., mph.	100	115	90
St. Spd., mph.	42	43	45
Take-off Run, ft.	390	200	300
Landing Roll, ft.	385	350	410
Rate of Climb, fpm.	710	960	760
Svc. Clng., ft.	15,750	19,000	17,000
Fuel Cap., gals.	18	36	36
Cr. Range, 75% hp., mi.	360	460	360
Span, ft.	35.3	35.3	35.3
Length, ft.	22.4	22.5	22.5
Height, ft.	6.7	6.7	6.7
Wing Area, sq. ft.	178.5	178.5	178.5
Wing Ldng., lbs. sq. ft.	8.4	10	11.6
Pow. Ldng., lbs. hp.	16.6	11.6	13.8

NOTES: Performance is for standard airplane at sea level and gross weight unless noted. Gross weight over 1,750 lbs. is permitted for special purposes under Part 8 of CAR.

Passengers not only view downtown Detroit (right) and Cleveland but TAG's de Havillands load and unload them in the city centers. This 600-hp. Otter carries 11 passengers as a float plane.

Float Plane Airline Serves City Centers

WATERFRONT passenger terminals have always appeared to offer the best possibilities for fast air transportation between Detroit and Cleveland, because airline airports are located far from the two city centers and time for ground travel exceeds that for air travel. Taxi Air Group, Inc., organized by Edward T. Knight and Egner A. Eklund, began operating float plane schedules between the two downtown waterfronts last spring. Between April and October, the two de Havillands carried 3,600 passengers and 3 tons of freight. They completed 98% of their scheduled trips at an average load factor of 49%.

For their operations, the pair selected a 450-hp. 5-passenger de Havilland Beaver and a 600-hp. 10-passenger de Havilland Otter, both manufactured at nearby Toronto. These workplanes, widely used by military forces as utility aircraft and light transports, and used in the Canadian bush country as excellent land, ski and float planes, have 130-mph. cruising speeds but their ability to operate from short water areas enable them to provide the shortest possible time for travel between the city centers.

Passengers complete the trip between Detroit and Cleveland in 50 to 60 minutes, as compared to more than three hours for an auto, bus or train to make the same trip. Because of airport-to-town traffic congestion, the float plane schedule also is faster than regular airline schedules. The service was started with four one-hour flights daily between Detroit and Cleveland. A second Otter has been ordered and a third Otter may be added.

The original Otter is going back to wheels this month and will be operated out of Miami, Florida, this winter as an air taxi.

Both Knight and Eklund established Taxi Air Group with extensive flying backgrounds of their own. Knight began flying in 1928 and in World War II was operations officer, executive officer and finally commanding officer of Marine Transport Group 15. Eklund is a major in the Marine Corps Reserve and has several thousand hours of military and commercial flying. Their chief pilot is Joseph S. Gaddis.

This waterfront ramp in Detroit eliminates long, time-consuming ground travel to outlying airports. Operations are from the Detroit River and from the lakefront at Cleveland. The 450-hp. Beaver carries 6 passengers as a float plane. Fare between Detroit and Cleveland is $14.

This 11-passenger twin-engine de Havilland Dove is one of three Doves operated by Illini Airlines, which also has a 14-passenger 4-engine de Havilland Heron on order. Operating into Chicago's downtown lakefront airport, Meigs Field, from outlying Illinois cities of Rockford, Freeport and Sterling—Rock Falls and Madison, Wisconsin, Illini carried 635 passengers in September and 740 passengers last month. Freight is also a major item.

Downtown Airline

A new category of scheduled air service below the local service level

By GEORGE HADDAWAY

LAST year when Congress directed the reluctant Civil Aeronautics Board to give permanent certificates of convenience and necessity to the nation's local service airlines, the old concept that you had to be a "grandfather" clause airline to engage in scheduled air transport received a good shaking.

There is a third category of scheduled air line operations well below the trunks and the local carriers. It's the shuttle or "commuter" type of operation serving towns below the local service category who want and imply that they will support scheduled services. Illini Airlines of Rockford, Illinois, is the classic example of this fertile field, and one that will be watched closely throughout aviation in the months ahead.

Less than two years old, Illini started operations with scheduled flights from Sterling, Illinois, into Chicago's lakefront, downtown Meigs Field, in March of 1955. They operated two round trips daily, three days a week with one Piper Apache. In June the service was increased to four round trips daily, five days a week. Public acceptance forced the company to seek larger equipment and in August of 1955 they purchased a de Havilland Dove. This airplane was so popular they acquired a second Dove in October and converted both into eleven passenger airplanes. Two round trips daily were then inaugurated be-

Enterprising Illini Airlines has an impressive maintenance set-up. Pictured in their shop, left to right, are John A. Hallen, maintenance superintendent; Fred Ottenberg, chief of airline maintenance; Patrick Hatswell, de Havilland technical representative, and John J. Thenikl, A & E mechanic.

Because of the downtown service offered its customers, Illini Airlines frequently fills its Dove seats. The cabin interior is shown at left, with seven passengers loading in the view above. In addition to regular schedules, the Doves also fly numerous charter trips.

tween Madison, Wisconsin; Rockford, Illinois, and Chicago. The Apache continued to run between Sterling and Chicago and Freeport, Illinois, and Chicago. Last December Illini signed a three year lease arrangement with the Greater Rockford Airport Authority to base at the Rockford Airport. They're beginning to see light.

Something of the growth of Illini can be gleaned from gross income figures. In March of 1955 with Apache service into Chicago from Sterling, total gross was $726. In September of that year, the Dove schedule increased the take to $1,429.90. In December of 1955 with new routes they grossed $3,180.80. Here are the figures for 1956:

January	$ 3,499.67
February	4,323.39
March	11,859.22
April	8,230.25
May	12,827.87
June	13,390.46
July	15,055.98
August	17,020.00
September	$21,000.00 (est.)

While charter work still represents a healthy portion of the gross business, scheduled passenger service accounts for the steady upward trend reflected in the 1956 figures above.

The Company is also building up a flight school and shop to attract more commercial business. Plans are under way to train hopeful airline pilots by giving them actual airline flight experience as co-pilots on the airline runs. Co-pilots are used only on IFR flights at the present.

Ingenuity of the new company is reflected in their operation at Freeport, Illinois. Here they manage the airport for the city, sell aviation fuel, hangar airplanes and have established a small flying school. This operation nets about $500 monthly.

During a five-day operating week last month they handled 220 passengers and 17,000 pounds of freight. Much of the freight is carried at night, with the quick-detachable passenger seats removed. Illini rates between Rockford and Chicago are $3 per hundred with a minimum charge of $2. Certificated airline rates are $4.85 per hundred with a minimum of $4. Rail Express is $4.06 and truck lines charge $3.09 with that the minimum. While Illini's rates are lower than the competition's, the growing freight business is largely a matter of better service, not price. Last month Illini hired a full-time experienced air freight salesman with the expectation of making air freight income one of the major sources of business.

Illini can not carry mail for the Post Office or air express under present regulations. Pending action on their application to the Civil Aeronautics Board for a certificate of convenience and necessity, probably on a temporary basis if granted, the company has to operate under Part 42 of the Civil Air Regulations governing aircraft under 12,500 pounds gross. Operating as they do in highly industrialized towns, some of which have no air service at all, Illini started hauling mail on a contract basis, the user paying the airline a small fee for getting his mail into Chicago after each working day. The Chicago Post Office cooperated and the Washington P. O. Department finally gave consent. Contract mail operations bring in $600 monthly. Illini had difficulty with the State of Illinois Commerce Commission who ordered them to stop operations some months ago. This was finally ironed out and the airline now has a certificate of convenience and necessity from the state.

These difficulties follow the classic pattern of what a small company has

(Continued on page 50)

These men are guiding Illini Airlines in its ambitious efforts, spearheaded by Douglas C. Harvey, president (seated). Left to right are Donald H. Swearingen, chief pilot; Leo Masiulis, passenger sales manager; Scott McCann, cargo sales manager, and John W. Bowman, first vice president.

It's All In The Records

By TOM ASHLEY

ONE of business flying's most interesting company operations is that of the Mene Grande Oil Company in Venezuela. With a fleet consisting of two Douglas DC-3's and a 4-place Beechcraft Model 35 Bonanza, Mene Grande's aviation department operates airline-type schedules as the backbone of its flight services and handles all of the company's special air transportation problems including a large amount of bush operations. One of its most interesting aspects is that Mene Grande maintains detailed and very accurate records of its aviation operations, much the same as scheduled airlines do.

Like many other business firms, Mene Grande (a Gulf Oil Company subsidiary) began its use of company aircraft on a modest, trial basis, learning almost immediately that the business plane had much to offer as a valuable and sometimes indispensable business machine. After acquiring its first DC-3, which is Venezuela-registered as YV-P-AEI, in June, 1946, the company added a second DC-3, YV-P-AEK, in April, 1947. These are not plush executive transports in the usual sense of the term. Instead, they are workaday aircraft, featuring such things as linoleum floor covering and seats which are not only easily removed but can be folded against the sidewalls to accommodate large freight loads without seat removal. Like many other operators of DC-3's, Mene Grande soon experienced the need for a smaller shuttle airplane and acquired a 4-place Model 35 Beech Bonanza in January, 1948, to handle small loads and short hops.

Not only expanding company operations but the lack of adequate air or surface transportation intensified the need for this air operation. Before it could be utilized, the company also had to provide its own home base airport facilities, located at San Tome, Venezuela. Its chief pilot, Vernelle Irwin, an American barnstormer and veteran airline pilot who had graduated into corporate flying in 1940 as a Socony Vacuum Oil Company captain in Venezuela, had both the experience and the vision to organize an aviation department capable of meeting the company's growing air travel needs.

Here's one of Mene Grande Oil Company's Douglas DC-3's. Chief pilot is Vernelle Irwin (wearing hat). This DC-3 has logged 5,000 hrs. since it was acquired in 1946.

Aircraft Expenses for 1955 Mene Grande Oil Company

	DC-3 AEI and DC-3 AEK Combined	Beech Bonanza AEM
DIRECT CHARGES		
Pilots and Co-pilots	$ 23,344	$ 4,077
Maintenance Crew	$ 26,507	$ 1,105
Hired Transportation	$ 258	.....
SERVICES DIRECT		
Payments to Contractors and Outsiders	$ 4,496	.....
Material and Supplies	$ 23,105	$ 6,037
Other Direct	$ 10,837	$ 1,165
Fuel, Oil and Grease	$ 46,855	$ 1,151
TOTAL DIRECT CHARGES	$135,402	$18,535
CLEARED FROM AIRPORT ACCOUNTS		
Company Transportation	$ 2,518	$ 533
Warehouse Handling	($ 2,281)	$ 227
Garage Expense	$ 48	.....
Indirect Labor	$ 17,761	$ 1,844
Airport Expense	$ 41,481	$ 2,185
TOTAL APPORTIONED ACCOUNTS	$ 59,534	$ 4,789
CLEARED FROM OTHER ACCOUNTS		
E.M. and Job Order Closings	$ 65,104	.....
Shop Expense	$ 37	$ 88
Insurance and Losses	$ 2,035	$ 223
Depreciation	$ 3,855	.....
TOTAL OTHER ACCOUNTS	$ 71,031	$ 311
TOTAL COSTS	$265,620	$18,635
Hours Flown	1,155:57	160:55
Total Flying Minutes	69,357	9,655
Total Thousand-Pound-Minutes	192,301	5,031
Cost Per M.-Pound-Minute	$ 1.381	$ 3.704
Cash Outlay Had Freight and Passengers Flown by Commercial Carriers	$293,450	$15,766
Cost Over (or Under) Cash Outlay	($27,830)	$ 2,869

Since 1946, the Mene Grande air fleet has logged 11,000 hours in the air, covering almost 2,000,000 miles and 10,000,000 passenger-miles. For the last two years, during which 2,636 hrs. were flown, the operational breakdown reads as follows for the three Mene Grande airplanes:

	Passengers	Lbs. of Cargo	Miles Flown
DC-3 AEI	5,396	731,926	208,904
DC-3 AEK	3,412	317,447	159,821
Beech AEM	751	9,945	59,125
TOTALS	9,559	1,059,318	427,850

Although it is not as large or as spectacular as some American corporate air fleets, the Mene Grande aviation department is in the realm of "busy" operations with this kind of airlift, flying an average of 4,800 passengers, half a million pounds of freight, 1,300 hours and 215,000 miles a year for the last two years.

It does all this flying within the confines of a relatively small area, roughly equivalent to less than the northern half of Texas. It is handicapped by the lack of all the facilities which assist corporate air fleets in the States, and practically all of its operations are restricted to daylight hours.

The Mene Grande area extends outward from its inland home base at San Tome to Caracas, 234 miles away, and thence to Maracaibo, 360 miles west of Caracas. Most of its flying is on regular schedules. For example, a DC-3 will leave the company base at San Tome on Mondays, Wednesdays and Fridays at 7 a. m., arrive at Caracas at 8:20 a. m. and depart there at 9 a. m., and arrive at Maracaibo at 10:50 a. m. The flight returns immediately, leaving at 11:30 a. m., reaching Caracas at 1:20 p. m. and departing there at 2 p. m. to return to San Tome at 3:30 p. m.

Company personnel make up the passenger lists — all grades of personnel. These are not "executive" air-

(Continued on page 52)

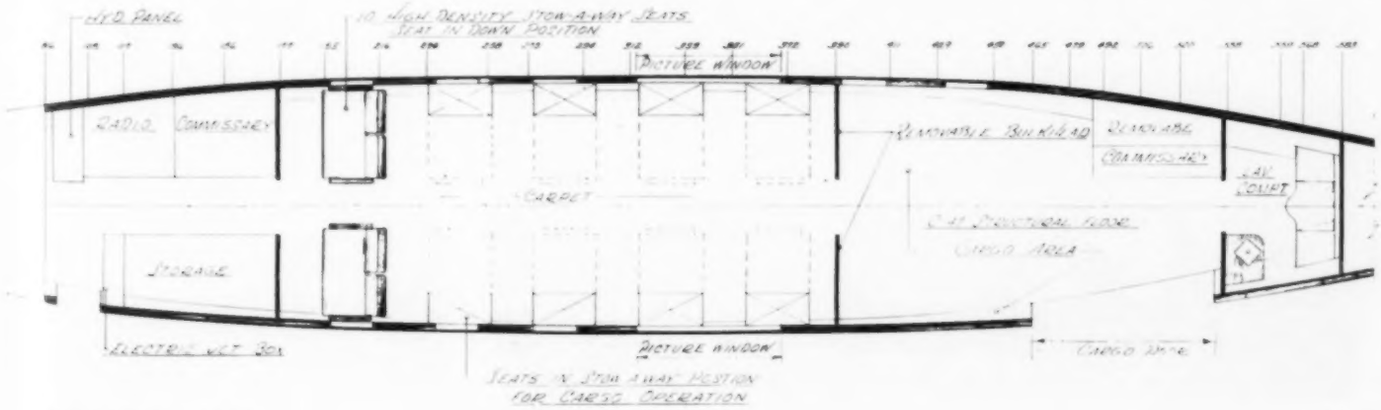
Aviation Operations Statistics
Two-Year Period, May 21, 1954-May 20, 1956
Mene Grande Oil Company

	Number Passengers Carried	Pounds Freight Carried	Hours Flown	Miles Flown
PERIOD 1954-1955				
Douglas DC-3 YV-P-AEI	3,337	466,529	736:14	124,304
Douglas DC-3 YV-P-AEK	1,193	100,076	403:29	62,101
Beech Bonanza YV-P-AEM	358	3,700	187:22	28,143
TOTALS	4,888	570,305	1,327:05	214,548
PERIOD 1955-1956				
Douglas DC-3 YV-P-AEI	2,059	265,397	500:09	84,600
Douglas DC-3 YV-P-AEK	2,219	217,371	602:24	97,720
Beech Bonanza YV-P-AEM	393	6,245	206:32	30,982
TOTALS	4,671	489,013	1,309:05	213,302
GRAND TOTALS	9,559	1,059,318	2,636:10	427,850

Cumulative Aircraft Operating Data and Costs
Mene Grande Oil Company
1946-1955

	Douglas DC-3 YV-P-AEI Acquired June, 1946	Douglas DC-3 YV-P-AEK Acquired April, 1947	Beech Bonanza YV-P-AEM Acquired Jan., 1948	Totals
FIXED EXPENSES				
Salaries, Wages, Employe Benefits				
Pilots and Co-Pilots	$ 198,226	$ 180,068	$ 41,962	$ 420,256
Maintenance Crew	62,288	54,317	12,980	129,585
Totals	$ 260,514	$ 234,385	$ 54,942	$ 549,841
Insurance				
Aircraft Liability	$ 24,746	$ 18,043	$ 3,008	$ 45,807
Depreciation				
Aircraft	$ 117,720	$ 96,098	$ 10,410	$ 224,228
Hangars, Eqpt., etc.	25,713	20,679	2,438	28,830
Hangar & Field Exp. Home Base	$ 110,704	$ 80,236	$ 8,611	$ 199,551
TOTAL FIXED EXPENSES	$ 539,407	$ 449,441	$ 79,409	$1,068,257
VARIABLE EXPENSES				
Pilot & Co-Pilot Travel Exp.	$ 4,666	$ 6,597	.....	$ 11,263
Operating Expenses				
Fuel & Oil	$ 166,146	$ 144,169	$ 12,356	$ 322,511
Landing Fees	33,928	26,291	14,008	74,227
Engine Repairs, Outside	221,207	183,189	6,081	410,477
Plane Repairs, Outside	48,020	39,032	.....	87,052
Spare Pts. & Gen. Eqpt.	55,961	51,602	26,910	134,473
Other (Pilot Trng., etc.)	124,118	94,182	8,116	226,416
TOTAL VARIABLE EXPENSES	$ 654,046	$ 545,062	$ 67,471	$1,266,579
TOTAL OPERATING COSTS	$1,193,453	$ 994,503	$146,880	$2,334,836
STATISTICAL DATA				
Total Hours Operated	4,896:57	3,846:49	1,885:17	10,629:03
Hourly Fixed Exp.	$ 110.15	$ 116.84	$ 42.12	$ 100.50
Hourly Var. Exp.	$ 133.56	$ 141.69	$ 35.79	$ 119.16
Total Hourly Cost	$ 243.71	$ 258.53	$ 77.91	$ 219.66
Total Cap. Passenger-Miles	16,248,440	12,923,270	836,170	30,007,880
Passenger-Miles Flown	5,430,357	4,024,274	439,889	9,894,520
Cost Per Avlbl. Psgr.-Mile	.07	.08	.18	.08
Cost Per Psgr.-Mile Flown	.22	.25	.33	.24
Total Miles Flown	812,919	645,663	278,793	1,737,375
Cost Per Mile	1.47	1.54	.53	1.34
Aircraft Passenger Cap.	20	20	3	.....
Average Cr. Spd., mph.	152	152	138	.....
Total Horsepower	2,400	2,400	185	.....

Floor plan for Mene Grande Oil Company DC-3's, converted by Executive Aircraft Service at Dallas, which also takes care of Mene Grande's 1,000-hr. overhauls and engine changes, is shown below. Note seats which fold against sidewalls and removable bulkhead for cargo. Rear compartment has linoleum floor.



He Never Stops Selling

Bell Helicopter Sales Pilot Joe Mashman practices what he preaches in selling the 4-place Model 47J for business flying. He flies to and from work in a J, and is shown here at his home in Dallas, 22 miles from the Bell factory. —(FLIGHT MAGAZINE Photo.)

THOSE who know Joe Mashman of Bell Aircraft Helicopter Division expect the extraordinary to develop when he takes a helicopter demonstrator out on a cross-country sales tour. It usually does, too.

The latest incident in a long series of unusual chapters of the colorful airman's career occurred last month in Peru. Joe saved an injured girl's life by airlifting her from a landing 17,500 feet up in the Andes, despite fog and low clouds, to a hospital in Lima.

Rescue and life-saving by helicopter is nothing new to Mashman, but this latest feat turned into one of the most dramatic life-savings a helicopter — especially a sales demonstrator — ever performed. This was no ordinary helicopter — it was Bell's first new-design Lycoming-powered 4-place Model 47J to make a sales tour, its pilot hopefully in search of all the breaks he could possibly get to dramatize its excellent performance capabilities. The J is to the firm's predecessor 3-place Model 47 what the Cadillac is to the Chevvie — it is, in many ways of performance, especially at altitude, the honest answer to a hard-bitten helicopter operator's fondest dreams. In any other copter, Mashman might just as well have not been around when the girl's plight became known in Peru, for nothing else could operate at the altitudes necessary. But with his new J, Mashman couldn't get to the girl fast enough to prove the machine's phenomenal capabilities in the rugged Andes.

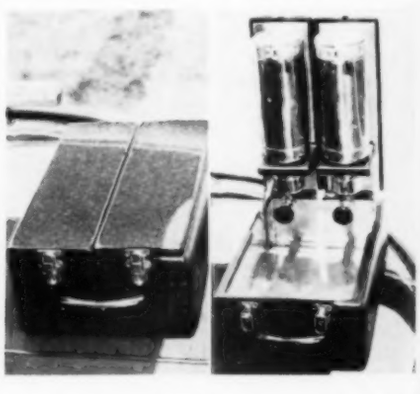
Returning to Lima with her, Mashman landed the helicopter in the hospital's courtyard, literally at the feet of waiting doctors — plus a crowd of 8,000 people gathered during the three-hour mercy mission, which was dramatically publicized as it unfolded. The girl's father wrote to thank Bell Aircraft Company, saying the achievement "has deeply touched the imagination of the Peruvian people."

"That's our Joe!" commented the factory crew when the letter arrived.

Mashman is at home anywhere with a helicopter. A pioneer copter pilot and salesman, who has introduced the rotary-wing aircraft to many countries of the globe, he is widely respected as being just about as sharp as copter pilots come, a pilot's pilot in the helicopter world. Presidents and royalty have been his guests aloft — the girl in Peru followed the presidents of five republics as passengers in his new Model 47J demonstrator.

They all take a liking to the friendly, mustachioed, nattily-dressed Mashman, who would rather fly than partake of a banquet amid presidential splendor. Helicopters are built for local flying and long cross-coun-

At home, Mashman's "heliport" is the lawn by his swimming pool (left and below). The thermos container below is one of several custom accessories Mashman has introduced to plush executive helicopters. The custom work of Horton & Horton, this one doubles as a carpeted foot-rest. —(FLIGHT MAGAZINE Photos.)



Shortly after being photographed at his Dallas home (opposite page), Mashman was touring South America with the 4-place J demonstrator and is shown here refueling in Ecuador at a banana plantation. —(Bell Aircraft Photo.)

try trips at 100-mph. helicopter speeds are anything but a joy ride to most pilots familiar with them. But copter demonstration junkets in Europe, South America, Asia or Texas are Joe's main dish and he has become the whirly-bird counterpart of a modern Marco Polo, who not only travels afar but always brings home the bacon.

Joe even flies to and from work in a helicopter. His home in Dallas, about 22 miles from the Bell helicopter factory, adjoins the city limits and was selected from the air because it had a lawn which the indefatigable Mashman could use as a heliport.

Bad weather seldom stops Mashman. On a proving flight to Colorado last winter where he demonstrated the Model 47J's high-altitude capabilities atop Pike's Peak and other mountains, a blizzard halted all traffic in the Texas Panhandle including trucks, autos and trains — but Joe kept the J flapping along through snow and gales, stopping just long enough to melt the ice off the canopy so he could see out.

Mashman is as good a salesman as he is a pilot, which means he's tops when it comes to closing deals. His sales imagination helped launch "executive" helicopters when he experimented with plushed interiors for the 3-place Bell — opening a whole new and prosperous market for the once ungainly-looking flying machines which now offer comfortable cabins. In this the 4-place Model 47J is the epitome of executive styling. Joe not only had Horton & Horton, the famous executive aircraft interior custom works, go the limit with the J's cabin, duplicating Cadillac's finest with actual Cadillac fabrics and materials, but threw in for good measure a deeply-piled red carpet on which South American presidents and other VIP's enter and leave the J when it calls for them at their marbeled doorsteps or on the ill-kept ramps of back-country airports. From Lima he sent Bill and Dorothy Horton a note thanking them for the good job they did plushing his ship — "Tremendous success everywhere," wrote Salesman Joe. "Presidents of five countries have praised your workmanship, including the president of Colombia who piloted the ship. Thanks."

In the flurry of advance orders for the 4-place J which Bell is now receiving — it sells for about $67,500 equipped — are South American purchases which Mashman has been closing on his long tour. He crossed the high Andes after leaving Lima, becoming the first helicopter to accomplish that feat, and will demonstrate in Argentina, Uruguay, Paraguay, Brazil and Venezuela before returning this month.

His 17,000-mile junket, patiently but expertly flown at 110 mph. and less with time out for rescues and any other services an enthusiastic pilot can offer, probably will have results other than the all-important sales it is producing. The engineers at Bell are bound to be the first people Mashman sits down with back at the factory.

"Joe's getting more out of the J than we believed possible," one of the factory men told us. "We've got to re-write the specs for higher performance." —T.A.

Presidents, royalty and even this Ecuadorian Indian have been guests on Mashman's flights. At Santo Domingo, Ecuador, he gave the barefoot Indian a hop while waiting for the weather to clear en route to Sangolqui, where the president of Ecuador (second from right, below) received demonstrations at his farm. —(Bell Aircraft Photos.)

Here's the Transland Ag-2 which made its first flight last month at Torrance, California. It is powered by a 450-hp. engine and is said to have payload capacity of 2,000 to 2,500 lbs. It was developed from the Texas A & M College Ag-1 experimental project.

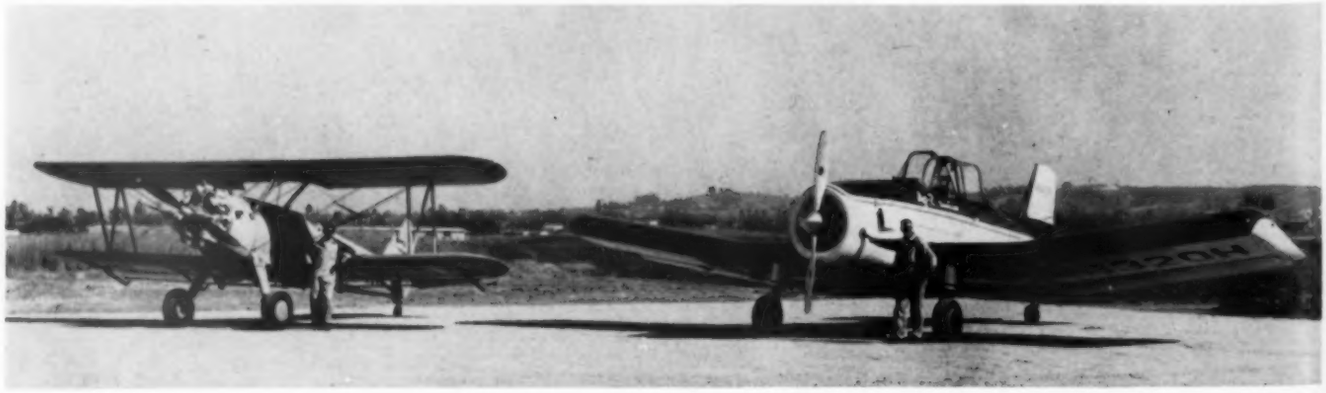
New Crop Planes for Efficiency

NEW designs and significant improvements to older designs are aimed at improving the usefulness of agricultural airplanes by giving them greater payloads, safer flying characteristics under conditions peculiar to aerial application work, more effective dispersal equipment and higher money-making capabilities.

Three examples of the improvements now being demonstrated are shown on these pages. They are the low-wing Transland Ag-2, the Clark Model 1000 biplane and England's Percival EP-9 high-wing.

The world's first aircraft designed specifically for aerial application work, the Ag-2 made its first flight last

Note thick wing of Ag-2 in these photos. It contains chemical tanks for 250 gals. and 125 gals. of fuel. Dust hopper of 53-cu. ft. capacity is in fuselage behind firewall. Note comparison of size with Stearman-type crop plane below.



Clark Model 1000 crop plane, shown in gleaming metal, was developed at Marshall, Texas, and has carried 1,000-lb. payload with 220-hp. Continental although it has not been loaded to gross yet. John Clark says it has flown 60 hrs. and is being certificated.

month at Torrance, California, where it will be produced by Transland Company, headed by George S. Wing. It culminates a 5-year development project which was the outgrowth of a design philosophy reflected in the experimental Ag-1 airplane, developed at Texas A & M College by Fred E. Weick with the sponsorship and assistance of the aircraft industry, government agencies including CAA and the Department of Agriculture, and organizations including the National Flying Farmers Association.

With a 450-hp. Pratt & Whitney engine, it has a design gross weight of 6,000 lbs. and an empty weight of 3,038 lbs. for a normal useful load of 2,962 lbs., providing for payloads ranging from 2,000 to 2,500 lbs. Its fuselage hopper is of 53-cu. ft. capacity and its standard wing tanks for spray chemicals are of 250-gal. capacity.

Designed for working at slow speeds and with heavy loads, the Ag-2 features an NACA 64021 airfoil, which is very thick for the accommodation of large chemical tanks inside the wing. This wing has full-span flaps and is said to provide a maximum lift coefficient about double that of conventional airfoil sections.

It will fly at 80 mph. with full load and with flaps down, using 58% of available horsepower, and has a normal cruising speed of 142 mph. for cross-country travel. Completely all-metal, it is designed for weather exposure and hard usage, with numerous access panels for inspection, cleaning and repair. A special "catalytic" conversion coating protects the structure from corrosive chemicals and the design uses no forgings and few castings.

The cockpit has been "sight engineered" for maximum visibility and the cockpit is structurally designed as an island of safety, sealing the pilot from chemical dusts and fumes.

Test Pilot Robert (Bat) Masterson said the first flight of the Ag-2 was successful and impressive. He said he was off the ground in less than 400 ft. and with a 4,033-lb. gross weight climbed at a rate of 1,400 fpm. at normal rated power. He expects to complete the flight test program for CAA certification by the end of the year.

R. (Tige) Tigerman and N. K. Spaise of Transland's sales office say the Ag-2 will be marketed through a world-wide dealer sales and service organization.

Ag-2 dimensions include 42-ft. span, 27-ft.-11-in. length, and 9-ft.-8-in. height. Gear tread is 10 ft. 10 ins., main wheel size is 27 ins., and tail wheel size is 14.5 ins.

Clark Model 1000

John C. Clark, president of Clark Aircraft, Inc., at Marshall, Texas, reports that his new crop plane, the Clark Model 1000, is now undergoing structural test for CAA certification and unofficial flight tests indicate it top performance. Clark has not released full details of his metal biplane, but reports on his project as follows:

"It is powered with a 220-hp. Continental engine and has flown satisfactorily with 1,000 lbs. of payload, but has not yet been loaded to full gross weight. It has been flown approximately 60 hrs. as of the first week in October. Stability, maneuverability and stall characteristics are very good.

"The fuselage is of semi-monocoque construction. The tripod-type landing gear with rubber shock strut arrangement has proved very satisfactory. Wings have stressed metal skin, metal ribs and square wing tips."

Percival EP-9

From England, Edgar Percival Aircraft, Ltd., Stapleford Airdrome, Essex, reports it has gone into full production on its high-wing agriculture airplane, the EP-9, and plans to produce 150 airplanes in 1957. Most will go to overseas areas, such as Australia and New Zealand.

The EP-9 is powered by a 270-hp., 6-cylinder, Lycoming GO-480-B engine. With a 3,980-lb. gross and 1,900-lb. empty weight, its useful load is 2,080 lbs. It is said to get off in 350 ft., climb at 990-fpm., cruise at 126 mph. and land at 37 mph. Its cabin has a large rear-loading clam door and contains 185 cu. ft. of cargo space with a floor area of 45 sq. ft. For passengers, it can carry six persons including the pilot. ★ ★ ★

Edgar Percival Aircraft of England is building 150 EP-9 crop planes, mostly for Australia and New Zealand. It has large compartment behind cockpit, with rear-loading clam door, and is powered by a 270-hp. Lycoming engine for 2,000-lb. useful load.

ANNOUNCING

NEW STRIKING EXTERIOR STYLING

You get your choice of three beautiful color combinations in the 1957 Tri-Pacer—Pasadena Rose, Cadillac Red or Key West Blue combined with Daytona White wings, fuselage trim and tail surfaces for high visibility, cabin coolness and pleasing appearance. Exclusive, tough Duraclad finish.

NEW CABIN COMFORT AND CONVENIENCE

Beautiful is the one word to describe the new Tri-Pacer's interior. Tough, long-lasting vinyl in Rose, Red or Blue combines with silver tufted nylon upholstery material and piping. Note adjustable front seats, convenient arm rest, individual window ventilators. Dual high capacity heaters keep cabin snugly warm in winter.

EXCLUSIVE REAR DOOR provides easiest access to rear seat, permits loading large, bulky items when rear seat is removed (in 15 seconds) for freight.

OUTSIDE BAGGAGE DOOR is another Tri-Pacer feature exclusive in its class. Lots of room for baggage, too.

NEW "RUNNING BOARD" adds to ease of entering and leaving front seat.

IDEAL INSTRUMENT PANEL

With IFR operations increasing for maximum utilization, the 1957 Tri-Pacer has the ideal instrument panel. Here's standard layout for Super Custom . . . full gyro panel on left in front of pilot, radios in center, engine instruments on right. Fully equipped Super Custom Tri-Pacer compares in price with other aircraft with no equipment.

Finer than ever... the beautiful new 1957 Piper Tri-Pacer 150! More than ever, the best value you can buy to fly!

Here's the airplane that gives you *practical* transportation... over 130 miles per hour cruise, superior high-altitude performance. The plane that gives you *dependable, economical* transportation... powered with the incomparable 150 horsepower Lycoming engine, proved beyond question to be the finest business-plane power plant.

Here's the plane that gives you *useful* transportation... attested by thousands upon thousands of highly satisfied Tri-Pacer owners, 88 per cent of whom say their business has increased since they started flying the Tri-Pacer.

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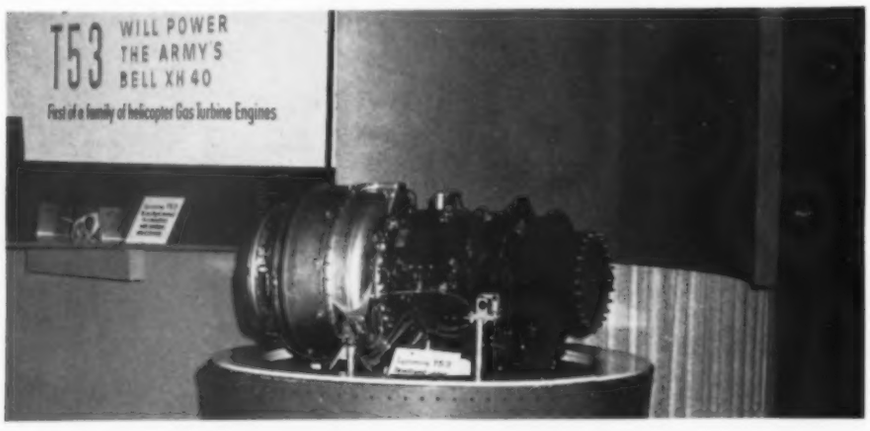
MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD

Two newly-developed helicopter shaft turbines which are expected to revolutionize helicopter performance were displayed at the Forum. They are the General Electric T-58 (above) and the Lycoming T-53 (below). The T-58, featuring supersonic compressor, is said to produce 1,050 hp. at a weight of only 250 lbs., has a diameter of only 16 ins., and a length of 55 inches. It will be installed experimentally in a Sikorsky HSS and a Vertol H-21. The T-53 powers the Army's new Bell XH-40, is rated at 825 hp. at a weight of 460 lbs., has a 23-in. diameter and 47.8-in. length.



Prominent in sessions of the Forum were the men pictured at left. At top, left to right, are Discussion Leaders Marvin Marks of McDonnell, W. F. Grady of Wright Air Development Center,. Joseph Stuart of Hiller, Dr. Barnes W. McCormick, Jr., of Vertol, Lew M. Graham of Bell and Norman E. Nelson of Doak. In the bottom photo are American Helicopter Society leaders. Left to right are John Beadling, Bell, Forum chairman; Robert Wheelock, Bell, regional vice president; Charles Seibel, Cessna, president; Brig. Gen. Carl Hutton, Ft. Rucker Commandant and Forum speaker, and Harry Lounsbury, AHS executive secretary
—(Bell Aircraft Photos.)

Western Helicopter Forum

LEADERS of the rotary-wing industry discussed development progress and problems during the American Helicopter Society's Third Annual Western Forum in Dallas last month.

Engineers and military and commercial operators participated in technical sessions covering development and utilization, with vertical take-off and landing aircraft (VTOL) included among technical papers and discussions.

A paper by Sanford Hinton of Cessna discussed boundary layer control using slot-suction and its flight testing, which showed the rotor blade stall to have been "essentially eliminated" at forward speeds somewhat above the normal blade-stall-limited speed of the test helicopter. Interesting films of using smoke generators to study of air flow through the rotor and tip-mounted ramjet engines of the Hiller YHJ-1 were shown.

Development of retractable rotors combining high performance with low disc loading was described by Tadeusz Tarczynski of Vertol, who said Vertol is using the idea of telescoping sections of a segmented blade with cables winding up on a retracting drum. Norman E. Nelson of Doak Aircraft discussed the highly-loaded ducted propeller as the optimum propulsion device for VTOL aircraft.

At the annual banquet, Brig. Gen. Carl I. Hutton, Army Aviation School post commander at Ft. Rucker, Ala., was the main speaker and urged more emphasis on perfecting the helicopter for short-haul shuttling of cargo than on the relatively long-haul carriage of people.

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Gains For Local Service Boardings

Mid-1956 compilation of local airline passenger boardings and departures

WITH five major local air service area proceedings currently under way before the Civil Aeronautics Board, FLIGHT MAGAZINE has compiled mid-year figures for local service airline passenger traffic at each of the 359 cities served by the locals. This is the second year for this FLIGHT MAGAZINE compilation as an exclusive service to readers and the mid-year report should provide current data for effective use by civic and airline parties to the five cases under way.

The mid-1956 figures show a continuing increase in local service passenger volume and for the first time, local service boardings exceeding 250,000 passengers a year at a single city are indicated — Chicago, which boarded 136,870 local service passengers during the first half of this year and which should approach a total of 300,000 by the end of December. Most of the cities, especially larger ones, show impressive gains over last year. The second half usually shows a gain over the first half, so that doubling the figures for the first half indicates an over-all 16% growth in traffic boardings at the first five cities. Cities showing impressive gains include Dallas, which has climbed this year from 9th to 6th position, and Washington, which has jumped into 9th place from last year's 20th position. Binghamton has advanced from 22nd to 13th and Buffalo from 30th to 20th.

Utica retains its leading position among cities served exclusively by local service airlines while in the same category Ithaca has moved from 3rd to 2nd, Eureka from 4th to 3rd, Rockford from 5th to 4th and Bradford from 8th to 5th. Monterey, previously 2nd, dropped entirely with the return of trunk service by United and Southwest, which formerly furnished that California hot spot with local service, has dropped some 700 passengers a month because of the reinstatement of United.

Passenger boardings per departure generally show an upward trend. Leading cities at mid-1956 (with the 1955 figure in parenthesis) are: New York 17.62 (15.89), Poughkeepsie 17.28 (14.78), Watertown, N. Y. 16.84 (8.13), Chicago 15.27 (14.72), Denver 15.11 (13.03), Washington 13.71 (13.14), Cincinnati 12.44 (11.44), Atlanta 12.32 (10.67), and Boston 11.81 (10.23). Among cities served exclusively by local airlines, the leaders in increased boardings per departure are Eureka 11.74 (10.42), Port Angeles 10.36 (10.94), Rockford 7.04 (6.82), North Bend 6.04 (5.63), McAllen 5.98 (7.62) and El Centro 5.30 (5.10).

Eleven cities appear in the local service listings for the first time with service inaugurated this year. Five cities have been dropped.

Traffic Record of Cities Served By Local Service Airlines First Six Months of 1956

SOURCE: CAB REPORTS

RANK 1st Half 1956	RANK Year 1955	CITY and CARRIER	FIRST HALF 1956 Passengers	FIRST HALF 1956 Departures
1	1	Chicago, Ill., NO, OZ, LC	136,870	8,963
2	2	New York, N. Y., MO, AL	75,818	4,303
3	3	Milwaukee, Wis., NO, OZ	41,909	5,929
4	4	San Francisco, Cal., SW	29,742	2,866
5	5	Pittsburgh, Pa., AL, LC	29,024	2,637
6	9	Dallas, Tex., TT, CE	27,913	4,326
7	6	Los Angeles, Cal., SW, BL	26,466	2,649
8	7	Phoenix, Ariz., BL, FL	24,186	2,382
9	20	Washington, D.C., PI, AL	22,262	1,624
10	8	Tri-Cities, Tenn., PI	20,553	3,416
11	13	St. Louis, Mo., OZ, CE	20,020	2,403
12	10	Cincinnati, O., PI, LC	20,145	1,620
13	22	Binghamton, N. Y., MO	19,864	2,640
14	12	Roanoke, Va. PI	18,193	3,660
15	11	Minn.-St. Paul, Minn., NO	18,091	2,178
16	14	*Utica, N. Y., MO	17,485	3,188
17	18	Denver, Colo., FL	16,941	1,121
18	15	Atlanta, Ga., SO	16,552	1,343
19	16	Seattle, Wash., WC	15,981	1,631
20	30	Buffalo, N. Y., MO, AL	15,142	1,619
21	25	*Ithaca, N. Y., MO	15,045	2,356
22	27	*Eureka, Cal., SW	14,900	1,269
23	35	Detroit, Mich., NO	14,881	2,515
24	23	Cleveland, O., AL, LC	14,711	1,544
25	34	*Rockford, Ill., OZ	14,287	2,030
26	21	Portland, Ore., WC	13,873	1,683
27	28	Memphis, Tenn., SO, TT	13,492	1,513
28	24	Scranton, Pa., AL	13,376	2,299
29	32	Louisville, Ky., PI, OZ	12,686	1,154
30	31	Madison, Wis., NO	12,026	1,985
31	26	Charlotte, N. C., PI, SO	11,869	1,430

*Indicates cities served exclusively by local service airlines.

/Indicates cities served for less than full period (seasonal service or service newly inaugurated.)

Carrier codes: AL, Allegheny; BL, Bonanza; CE, Central; FL, Frontier; LC, Lake Central; MO, Mohawk; NO, North Central; OZ, Ozark; PI, Piedmont; SO, Southern; SW, Southwest; TT, Trans-Texas; WC, West Coast.

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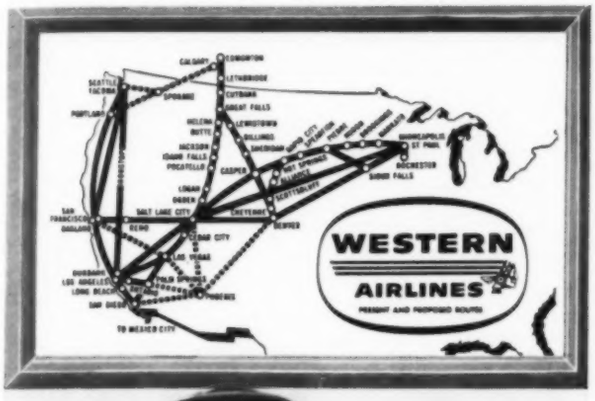
Allison Prop-Jet Engines and Aeroproducts Propellers



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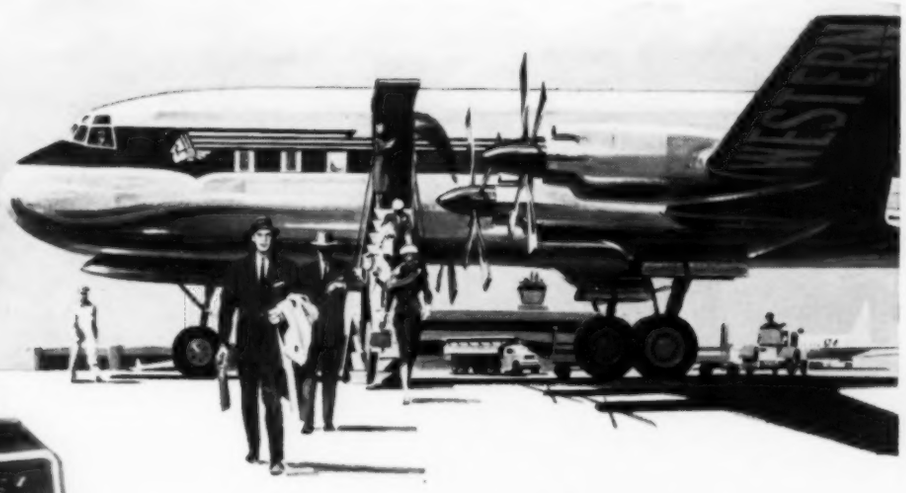

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ALLISON
PROP-JET POWER

AMERICAN BUILT FOR THE JET ERA IN AIR TRAVEL

RANK 1st Half 1956	RANK Year 1955	CITY and CARRIER	FIRST HALF 1956 Passengers	FIRST HALF 1956 Departures
32	33	Columbus, O., LC, PI	11,732	1,478
33	41	Peoria, Ill., OZ	11,658	2,085
34	55	South Bend, Ind., NO, LC	11,605	2,500
35	29	Las Vegas, Nev., BL	10,963	1,154
36	49	Harrisburg, Pa., AL	10,678	2,177
37	17	Richmond, Va., PI	10,309	1,743
38	45	*Bradford, Pa., AL	10,305	2,801
39	43	Houston, Tex., TT	10,221	1,220
40	44	Erie, Pa., AL	10,038	2,109
41	47	Indianapolis, Ind., LC, OZ	10,005	1,765
42	36	Charleston, W. Va., PI	9,882	2,296
43	42	Springfield, Ill., OZ	9,789	2,697
44	54	Elmira, N. Y., MO	9,780	1,735
45	19	Monterey, Cal., SW	9,595	1,435
46	38	Huntington, W. Va., PI, AL	9,396	1,996
47	37	*Green Bay, Wis., NO	9,307	3,773
48	65	*Kalamazoo, Mich., NO, LC	9,123	2,359
49	91	Watertown, N. Y., MO	9,062	538
50	46	*Duluth, Minn., NO	8,966	1,534
51	53	Boston, Mass., MO	8,574	726
52	68	Ft. Worth, Tex., CE, TT	8,105	3,414
53	57	Salt Lake City, Utah, FL	7,870	728
54	48	Williamsport, Pa., AL	7,786	1,565
55	52	Atlantic City, N. J., AL	7,591	1,048
56	56	*Oshkosh, Wis., NO	7,564	2,038
57	39	Medford, Ore., WC, SW	7,462	1,350
58	63	Boise, Ida., WC	7,371	759
59	51	Norfolk, Va., PI	7,214	1,013
60	50	*Fayetteville, N. C., PI	6,849	1,554
61	191	*Charlottesville, Va., PI	6,667	1,774
62	69	Beaumont, Tex., TT	6,611	1,017
63	59	*Champaign, Ill., OZ	6,561	1,630
64	74	Parkersburg, W. Va., AL, PI	6,449	1,806
65	67	Grand Junction, Colo., FL	6,439	968
66	62	*North Bend, Ore., WC	6,414	1,062
67	87	San Antonio, Tex., TT	6,319	1,818
68	60	Lexington, Ky., PI	6,214	2,224
69	72	Raleigh, N. C., PI	6,197	1,448
70	66	Yakima, Wash., WC	6,131	2,289
71	61	Sacramento, Cal., SW	6,129	1,335
72	79	Ft. Smith, Ark., CE	6,105	1,710
73	95	Syracuse, N. Y., MO	6,104	1,427
74	113	Rochester, N. Y., MO	6,008	1,739
75	82	*San Jose, Cal., SW	6,002	1,970
76	78	*Lynchburg, Va., PI	5,975	2,741
77	99	Billings, Mont., FL	5,908	724
78	64	Philadelphia, Pa., AL	5,866	878
79	114	*Battle Creek, Mich., NO	5,696	1,363
80	70	Albany, N. Y., MO	5,609	1,313
81	73	Little Rock, Ark., TT, CE	5,509	1,305
82	93	Monroe, La., SO	5,491	859
83	97	*El Centro, Cal., BL	5,436	1,025
84	89	New Orleans, La., SO	5,416	692
85	71	*Decatur, Ill., OZ	5,331	1,639
86	77	*Pasco, Wash., WC	5,207	1,555
87	81	Albuquerque, N. M., FL	5,181	455
88	76	Kansas City, Mo., CE, OZ	4,993	617
89	83	Grand Rapids, Mich., LC, NO	4,992	1,458
90	100	*Yuma, Ariz., BL	4,972	1,083
91	88	Jackson, Miss., SO	4,670	833
92	92	Spokane, Wash., WC	4,650	982
93	103	*Tyler, Tex., TT	4,589	2,164
94	96	*Wausau, Wis., NO	4,587	1,612
95	160	Paducah, Ky., OZ	4,480	941
96	—	Burbank, Cal., SW, BL	4,448	1,228
97	161	Casper, Wyo., FL	4,447	706
98	84	Columbus, Ga., SO	4,371	1,035
99	129	Shreveport, La., TT	4,355	1,232
100	111	*McAllen, Tex., TT	4,301	719
101	75	Knoxville, Tenn., PI	4,206	512
102	80	*Johnstown, Pa., AL	4,199	1,379
103	117	Jacksonville, Fla., SO	4,177	528
104	86	*Lewiston, Ida., WC	4,133	1,111
105	119	Reno, Nev., BL	4,066	367
106	98	Moline, Ill., OZ	4,043	1,002
107	106	*Farmington, N. M., FL	4,014	1,607
108	108	Wilmington, N. C., PI	3,990	859
109	112	Corpus Christi, Tex., TT	3,930	1,530
110	135	Hot Springs, Ark., TT, CE	3,881	1,296
111	107	*Greenville, Miss., SO	3,821	1,351
112	121	*Lafayette, Ind., LC	3,817	929
113	110	*Altoona, Pa., AL	3,814	1,537
114	326	Poughkeepsie, N. Y., MO	3,802	220
115	102	*Port Angeles, Wash., WC	3,709	358
116	85	*Jamestown, N. Y., AL	3,778	1,292
117	58	Santa Barbara, Cal., SW	3,772	995
118	90	Tulsa, Okla., CE	3,727	874
119	105	Winston-Salem, N. C., PI	3,725	1,464
120	130	*Harlingen, Tex., TT	3,701	1,369
121	94	*Bluefield, W. Va., PI	3,675	1,525
122	125	Walla Walla, Wash., WC	3,658	1,365
123	116	Joplin, Mo., CE, OZ	3,641	1,300
124	158	Ontario, Cal., BL	3,591	852
125	122	*Mansfield, O., LC	3,492	1,465
126	101	Greensboro, N. C., PI	3,459	1,611
127	131	Baton Rouge, La., SO	3,357	1,373
128	127	*Janesville, Wis., NO	3,305	1,150
129	180	San Diego, Cal., BL	3,253	1,052
130	156	*Longview, Tex., TT	3,228	1,783
131	115	*Flagstaff, Ariz., FL	3,188	960
132	123	San Angelo, Tex., TT	3,150	778
133	133	Gulfport, Miss., SO	3,122	462
134	128	Birmingham, Ala., SO	3,024	971
135	124	*Redding, Cal., SW	2,928	705
136	134	*Chico, Cal., SW	2,901	1,033
137	146	Oklahoma City, Okla., CE	2,879	706
138	104	Oakland, Cal., SW	2,844	1,432
139	190	*Columbia, Mo., OZ	2,809	1,027
140	145	*Crescent City, Cal., SW	2,770	816
141	139	Eugene, Ore., WC	2,755	1,192
142	120	*Phillipsburg, Pa., AL	2,751	880
143	138	*Columbus, Miss., SO	2,708	963
144	118	Asheville, N. C., PI	2,620	697
145	137	*Durango, Colo., FL	2,619	958
146	154	Youngstown, O., LC	2,617	302
147	136	Lawton, Okla., CE	2,586	702
148	140	*Wenatchee, Wash., WC	2,580	667
149	143	Terre Haute, Ind., LC	2,575	684
150	159	*Pullman, Wash., WC	2,567	737
151	176	Idaho Falls, Ida., WC	2,562	378
152	141	Pueblo, Colo., FL	2,549	1,378
153	New	Bakersfield, Cal., SW	2,489	842
154	149	*Tuscaloosa, Ala., SO	2,460	965
155	144	Valdosta, Ga., SO	2,397	1,011
156	220	Austin, Tex., TT	2,375	1,390
157	162	*Fayetteville, Ark., CE	2,329	1,426
158	201	*Lima, O., LC	2,310	730
159	172	Albany, Ga., SO	2,301	1,020
160	40	*Auburn, N. Y., MO	2,295	829
161	151	*Gadsden, Ala., SO	2,274	944
162	352	*Laredo, Tex., TT	2,270	380
163	163	Quincy, Ill., OZ	2,249	519
164	165	*La Crosse, Wis., NO	2,218	764
165	178	*Stephens Point, Wis., NO	2,215	1,259
166	165	Cheyenne, Wyo., FL	2,166	710
167	153	Wichita, Kan., CE, OZ	2,154	291
168	184	Wheeling, W. Va., AL	2,113	889
169	187	Lansing, Mich., NO	2,113	964
170	152	*Roseburg, Ore., WC	2,113	1,014
171	126	*Jackson, Mich., NO	2,111	1,287
172	132	*Natchez, Miss., SO	2,077	1,205
173	171	*Hagerstown, Md., AL	2,076	601
174	177	*Eau Claire, Wis., NO	2,034	1,107
175	175	*Texarkana, Ark., TT	2,028	694
176	167	Newport News, Va., PI	2,026	1,334
177	168	*Victoria, Tex., TT	2,004	1,216
178	148	*Franklin, Pa., AL	1,982	691
179	189	Pocatello, Ida., WC	1,981	716
180	170	*Marysville, Cal., SW	1,976	1,016
181	202	*Ephrata, Wash., WC	1,972	712
182	142	*Prescott, Ariz., FL	1,957	1,687
183	173	*Danville, Ill., LC, OZ	1,921	962
184	195	Lancaster, Pa., AL	1,865	775
185	181	Worcester, Mass., MO	1,852	932
186	147	*Riverton, Wyo., FL	1,824	1,048
187	198	Springfield, Mo., OZ	1,818	643
188	182	*Chisholm, Minn., NO	1,802	717
189	109	*Oxnard, Cal., SW	1,800	724
190	169	*Cortez, Colo., FL	1,791	697
191	164	*Santa Rosa, Cal., SW	1,768	722
192	296	*Indio, Cal., BL	1,760	710
193	157	*Jefferson City, Mo., OZ	1,759	992
194	197	*Escanaba, Mich., NO	1,713	531
195	268	*Dubuque, Ia., OZ	1,710	654

*Indicates cities served exclusively by local service airlines.

†Indicates cities served for less than full period (seasonal service or service newly inaugurated.)

Carrier codes: AL, Allegheny; BL, Bonanza; CE, Central; FL, Frontier; LC, Lake Central; MO, Mohawk; NO, North Central; OZ, Ozark; PI, Piedmont; SO, Southern; SW, Southwest; TT, Trans-Texas; WC, West Coast.

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ELLIOTT FLYING SERVICE
Municipal Airport, Davenport, Iowa

LOPEZ GRACE AVIATION, INC.
Miami International Airport
Building 354
Miami, Florida

ROSCOE TURNER AERONAUTICAL CORP.
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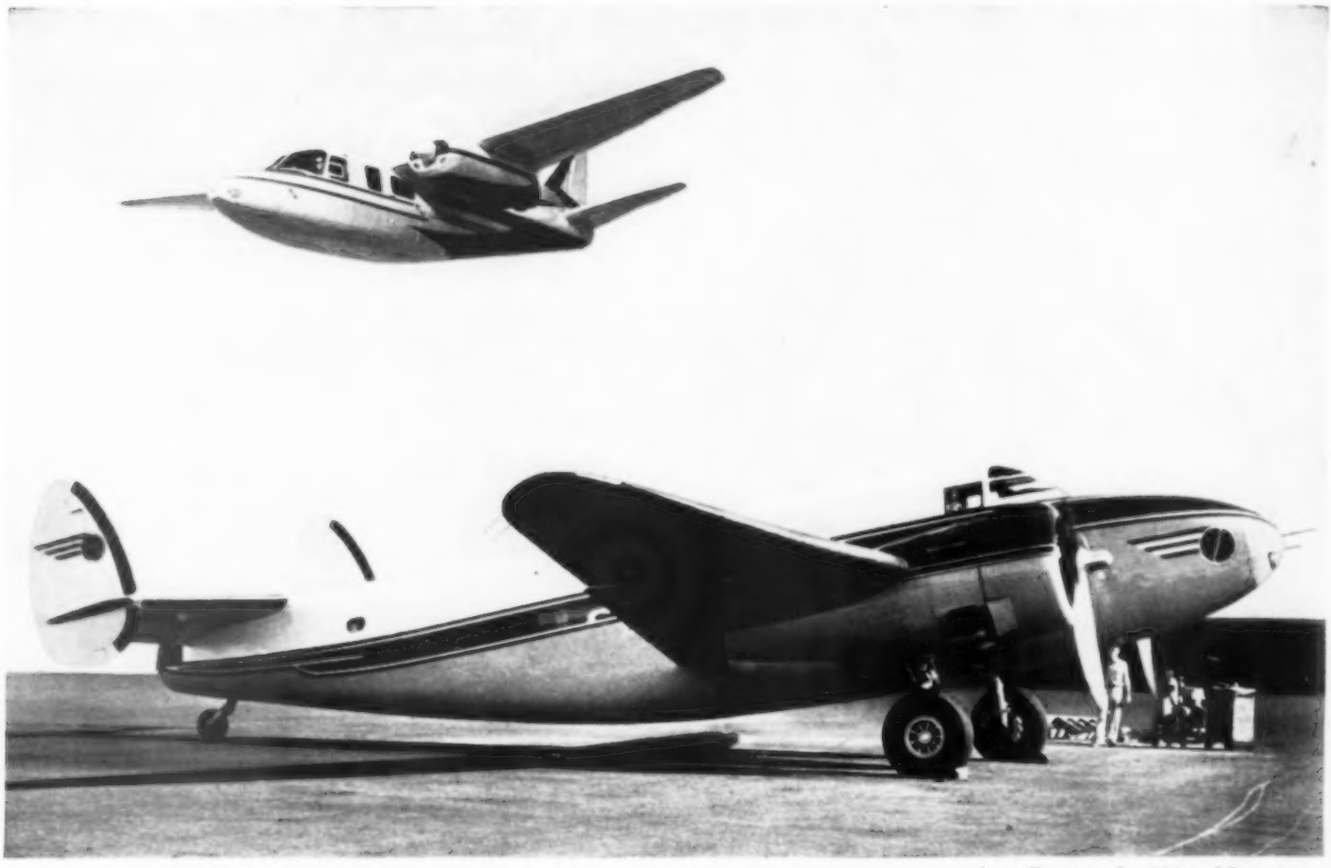

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Experience in all kinds of service proves New Series D greatly *reduces carbon, coke and varnish collection* around rings and valve stems. *Eliminates harmful deposits* in the combustion chambers.

More hours between overhauls

New Series D offers you an unusually tough lubrication film, too. *Cuts down wear on engine parts substantially*. The result? Far lower *operating* and *maintenance* costs! Safer *engine performance!* Why not try it and see for yourself?

NEW GULFPRIDE AVIATION

GULF

AVIATION PRODUCTS

SERIES D

"... and there, Rangers, is my dad's big stallion ... and this here is his favorite corral!"

There is an old saying — **if you want the truth, ask a child.** This young member of the Lone Ranger set expresses both fact and pride in repeating in his own words statements he has heard his father make. Before "our little sheriff" finishes he will explain to his "posse" that his dad's big stallion **(Super 18 Beechcraft** to us ole folks) can cross the plains, hills and mountains day or night at 215 miles per hour and make a round trip between Houston and Chicago in the same day.

Despite his tender age, this youngster could also tell his friends a lot about the J. D. Reed Company and why his dad has always been able to count on their dependable service. In summing up his father's opinion of the J. D. Reed Company service and maintenance work he will undoubtedly say, "the way they take care of my dad's stallion makes it more **super** than Super-Man."

One visit to the J. D. Reed Company will convince you that our modern facilities, extensive equipment and factory trained technicians is the SUPER combination that can keep your aircraft and its accessories operating like new. You have a lot to gain by doing business with the J. D. Reed Company and we are anxious to serve you.

J.D. REED CO. INC.
SALES SERVICE
Beechcraft
DISTRIBUTOR
MUNICIPAL AIRPORT
HOUSTON, TEXAS

RANK 1st Half 1955	RANK Year 1955	CITY and CARRIER	FIRST HALF 1956 Passengers	FIRST HALF 1956 Departures
196	207	*Corvallis, Ore., WC	1,707	1,167
197	217	*Hickory, N. C., PI	1,639	1,022
198	212	*Kinston, N. C., PI	1,630	645
199	196	*Marinette, Wis., NO	1,623	881
200	199	*Santa Maria, Cal., SW	1,619	823
201	155	*Winslow, Ariz., FL	1,612	899
202	219	White Plains, N. Y., MO	1,602	522
203	150	Mobile, Ala., SO	1,584	325
204	193	*Bloomington, Ill., OZ	1,579	617
205	185	*Rhinelander, Wis., NO	1,570	792
206	208	Klamath Falls, Ore., WC	1,569	350
207	223	Santa Ana, Cal., BL	1,545	928
208	233	Dayton, O., LC	1,538	628
209	194	*Salisbury, Md., AL	1,537	444
210	200	Tucson, Ariz., FL	1,518	362
211	236	Twin Falls, Ida., WC	1,501	710
212	216	*Tupelo, Miss., SO	1,490	930
213	192	*Ponca City, Okla., CE	1,479	776
214	179	*Hoquiam, Wash., WC	1,456	414
215	213	*Borger, Tex., CE	1,441	374
216	218	*Moultrie, Ga., SO	1,431	1,002
217	174	Bartlesville, Okla., CE	1,420	423
218	211	*Beckley, W. Va., PI	1,420	1,178
219	227	*Rock Springs, Wyo., FL	1,417	717
220	205	*Vicksburg, Miss., SO	1,416	824
221	215	*Marquette, Mich., NO	1,407	653
222	209	*Kokomo, Ind., LC	1,405	941
223	228	*Manitowoc, Wis., NO	1,395	752
224	203	*Alamosa, Colo., FL	1,385	994
225	New	*Sherman, Tex., CE	1,377	516
226	225	Nashville, Tenn., OZ	1,360	338
227	231	New Bern, N. C., PI	1,360	541
228	204	*Gallup, N. M., FL	1,360	699
229	232	*Houghton, Mich., NO	1,345	324
230	186	*Enid, Okla., CE	1,332	728
231	New	Lake Charles, La., TT	1,315	533
232	206	*Vernal, Utah, FL	1,304	704
233	188	*Astoria, Ore., WC	1,281	408
234	221	*Laramie, Wyo., FL	1,265	685
235	210	*International Falls, Minn., NO	1,253	317
236	278	Mason City, Ia., OZ	1,248	667
237	224	*Williston, N. D., FL	1,197	716
238	250	Greenville, S. C., SO	1,177	571
239	239	*Pine Bluff, Ark., TT	1,140	1,290
240	242	*Lufkin, Tex., TT	1,110	758
241	New	Lafayette, La., TT	1,092	265
242	241	Amarillo, Tex., CE	1,087	194
243	238	*Iron Mountain, Mich., NO	1,080	617
244	183	*Westfield, Mass., MO	1,066	586
245	222	*Worland, Wyo., FL	1,048	719
246	243	*El Dorado, Ark., TT	1,043	587
247	230	*Muskogee, Okla., CE	1,009	940
248	253	*Cape Girardeau, Mo., OZ	994	657
249	309	Fort Dodge, Ia., OZ	969	634
250	226	*Cody, Wyo., FL	935	388
251	269	*Greenwood, S. C., SO	920	612
252	240	Bismarck, N. D., FL	919	358
253	244	*Montrose, Colo., FL	907	447
254	234	*Athens, Ga., SO	905	612
255	247	*Bloomington, Ind., LC	887	581
256	235	*Duncan, Okla., CE	880	689
257	261	*Clarksville, Tenn., OZ	875	653
258	254	*Dover, Del., AL	872	301
259	245	*Marion, O., LC	872	988
260	272	Grand Forks, N. D., NO	863	330
261	246	*Laurel, Miss., SO	858	644
262	280	Wilmington, Del., AL	841	686
263	340	Owensboro, Ky., OZ	812	699
264	259	*Kingman, Ariz., BL	806	702
265	252	*Marion-Herrin, Ill., OZ	804	598
266	256	*Richmond, Ind., LC	779	603
267	277	*Clintonville, Wis., NO	750	631
268	248	*San Luis Obispo, Cal., SW	737	369
269	258	*Bemidji, Minn., NO	737	588
270	285	*Blythe, Cal., BL	736	671
271	294	Trenton, N. J., AL	724	597
272	264	*Brownwood, Tex., TT	710	877
273	249	*Glendive, Mont., FL	709	672
274	332	Waterloo, Ia., OZ	707	678
275	262	*New Philadelphia, O., LC	704	729
276	324	Sioux City, Ia., OZ	689	338
277	273	*Red Bluff, Cal., SW	674	599
278	265	*Miles City, Mont., FL	673	706
279	255	*London, Ky., PI	661	752
280	263	*Olympia, Wash., WC	638	621
281	270	*Zanesville, O., LC	635	574
282	214	*Coeur d'Alene, Ida., WC	626	619
283	312	*Watsonville, Cal., SW	604	611
284	328	*Silver City, N. M., FL	603	271
285	266	*Paris, Tex., CE	600	679
286	267	*Ukiah, Cal., SW	589	295
287	274	*Clinton, Ia., OZ	587	625
288	276	*Charleston, Ill., OZ	570	454
289	279	*Ardmore, Okla., CE	546	286
290	297	*Stillwater, Okla., CE	544	327
291	282	*Southern Pines, N. C., PI	533	226
292	260	*Brainerd, Minn., NO	530	566
293	293	*Winona, Minn., NO	524	645
294	303	Pendleton, Ore., WC	512	352
295	295	*Pittsburg, Kan., OZ	491	552
296	298	*Burley, Ida., WC	485	720
297	287	*Camden, Ark., TT	478	585
298	314	*Ada, Okla., CE	473	275
299	291	Spartanburg, S. C., SO	473	579
300	286	*Yreka, Cal., SW	456	321
301	229	Stockton, Cal., SW	447	392
302	289	*Danville, Va., PI	446	308
303	308	College Station, Tex., TT	439	522
304	299	*Cairo, Ill., OZ	422	619
305	305	*Gunnison, Colo., FL	402	429
306	306	Baltimore, Md., AL	401	149
307	283	*Dickinson, N. D., FL	401	616
308	281	*Easton, Md., AL	393	301
309	275	*Monte Vista, Colo., FL	392	531
310	323	*Galveston, Tex., TT	391	352
311	288	*Wolf Point, Mont., FL	382	350
312	319	*Ontario, Ore., WC	380	347
313	311	*Thief River Falls, Minn., NO	376	475
314	310	*Magnolia, Ark., TT	376	578
315	307	*Lock Haven, Pa., AL	366	369
316	271	El Paso, Tex., TT	357	174
317	316	*Safford, Ariz., FL	351	343
318	302	*Kerrville, Tex., TT	351	668
319	331	*Beeville, Tex., TT	339	906
320	315	*Chehalis, Wash., WC	337	494
321	325	*Greybull, Wyo., FL	335	326
322	304	*Powell, Wyo., FL	335	337
323	251	*Myrtle Beach, S. C.†, PI	330	69
324	284	*Sidney, Mont., FL	326	349
325	318	*Cumberland, Md., AL	325	146
326	237	*Cape May, N. J.†, AL	315	220
327	300	Keene, N. H., MO	317	271
328	336	*Ft. Bragg, Cal., SW	308	364
329	333	*Clifton, Ariz., FL	302	338
330	321	*Ellensburg, Wash., WC	298	481
331	330	*Baker, Ore., WC	295	346
332	292	*Marfa, Tex., TT	292	349
333	290	*Asbury Park, N. J., AL	272	336
334	334	*LaGrande, Ore., WC	269	325
335	343	*Marshall, Tex., TT	259	780
336	329	*Ft. Stockton, Tex., TT	257	350
337	317	Pittsfield, Mass., MO	256	240
338	322	*Pecos, Tex., TT	245	348
339	335	*Hawthorne, Nev., BL	244	276
340	301	*Rawlins, Wyo., FL	236	269
341	New	*Burlington, Ia.†, OZ	224	56
342	338	*Tonopah, Nev., BL	211	338
343	327	*McAlester, Okla., CE	187	295
344	337	*Helena, Ark., TT	169	408
345	313	*Gary, Ind., LC	143	259
346	New	Des Moines, Ia.†, OZ	140	28
347	344	*Brady, Tex., TT	127	401
348	320	*Land O'Lakes, Wis.†, NO	116	80
349	345	*Woodward, Okla., CE	103	237
350	342	*Morehead City, N. C.†, PI	100	27
351	New	*Ottumwa, Ia.†, OZ	98	56
352	347	*Stuttgart, Ark., TT	80	411
353	New	Waco, Tex.†, TT	78	62
354	339	*Coleman, Tex., TT	73	345
355	New	Temple, Tex.†, TT	53	62
356	New	Panama City, Fla.†, SO	19	4
357	341	*Georgetown, Md.†, AL	16	17
358	346	*McCall, Ida.†, WC	9	26
359	New	Dothan, Ala.†, SO	7	8

*Indicates cities served exclusively by local service airlines.

†Indicates cities served for less than full period (seasonal service or service newly inaugurated.)

Carrier codes: AL, Allegheny; BL, Bonanza; CE, Central; FL, Frontier; LC, Lake Central; MO, Mohawk; NO, North Central; OZ, Ozark; PI, Piedmont; SO, Southern; SW, Southwest; TT, Trans-Texas; WC, West Coast.

Executive DC-3s now ready—

A new one each month

Deluxe DC-3

Today's fastest and quietest DC-3. Luxurious lounge type interior, with extra large cabin and picture windows. Retractable tail wheel, new lightweight landing gear cover doors, flush loops, many other extras. Choice of Collins or Bendix executive radio. New ship guarantee, with complete disassembly and overhaul, and 800 hour guarantee on your choice of engines.

Special DC-3

Comfortable fourteen place interior, with big windows, choice of Bendix or Collins executive radio. New ship guarantee, with complete disassembly and overhaul, and 800 hour guarantee on your choice of engines.

Also available to your order — automatic pilot, X or C band radar, extra Bendix, Collins, Sperry, A.R.C., Wilcox, radio and electronics, lightweight landing gear cover doors, retractable or faired tail wheel, special cowlings, outer wing tanks, 26900 manual, additional picture windows, choice of engines — Super-92 Pratt & Whitney R1830-75 -92 -94 R2000 Wright R1820-56, -72.

Others to your modifications

LAST OF THE LOW TIME C47s (2307-4021 hours)

- **now in various stages of disassembly, overhaul, and conversion**
- at our four conversion centers (St. Louis, Toledo, McBride, Pompano)

- **can be completed with many of your own specifications**
- —send us a list of your wishes, and we'll give you a price

The famous, proven, all-weather DC-3, "the world's most experienced airplane", is still the all around most practical and efficient large executive aircraft, unsurpassed and unreplaced by later designs. It has unquestioned dependability, with long range, high speed, big capacity, small airport ability, top performance and handling characteristics, for economical maintenance and operating costs lower than those of many smaller planes. It makes the average business trip a matter of two or three comfortable hours of roomy, convenient, undisturbed privacy, free from the annoyances of tight schedules, layovers, transfers, cancellations, and baggage delays. It's the modern way to cover more territory and still have more time to enjoy life at home. Write today for a copy of an interesting history of this ubiquitous airplane, with many fascinating anecdotes about its remarkable, many sided civilian, military, commercial, and private careers.

Custom 18 Available

This proven all-weather business airplane was taken in trade by us on a larger plane, completely overhauled, converted to our popular Custom 18 design, and fitted with modern radio and equipment. Roomy cockpit, enlarged cabin, adjustable chairs, big picture windows, snack bar, beautiful interior. New ship guarantee, NTSO engines.

Modernize your own Model 18

Make your own travels pleasant and relaxing with portions or all of this modern, practical modification and renovation. Combine it with your next big inspection, and in less than you might think, you'll have the satisfaction of a new ship, at a fraction of the cost.

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Inc. of **ST. LOUIS** Lambert Field

Inc. of **TOLEDO** Express Airport

Inc. of **FLORIDA** Pompano Beach

Sales Parts — Overhaul Conversions — **Lodestar DC-3 Beech** — Inspections Maintenance — Radios Engines

AIR REPORT

(Continued from page 6)

and the remainder furnished in the form of British Rolls-Royce Conway engines.

BELL AIRCRAFT LAST MONTH DELIVERED ITS 100TH COMMERCIAL HELICOPTER OF 1956, during which its commercial copter deliveries have been 30% above those of last year. Harvey Gaylord, manager, said the 100th machine went to John Wilson's Mid-States Aviation of Northbrook, Illinois, which will offer it to lease customers.

TOTAL 1956 SALES EXCEEDING $66,000,000 HAVE BEEN REPORTED BY CESSNA AIRCRAFT COMPANY, a 32% increase over 1955 sales which totaled $50,000,000. The 1956 sales include 2,943 commercial aircraft as compared to only 1,586 units last year, an 86% increase. Cessna's net earnings for fiscal 1956 exceed $5.50 per share as compared with $3.88 last year, according to Dwane Wallace, president.

THE LYCOMING TURBINE-POWERED BELL XH-40 UTILITY HELICOPTER made its first flight on Oct. 22 before members of the Army Research and Development Board, only 16 months after its development was contracted by the Army and about 6 months after the wooden mock-up was approved. Maj. Gen. H. H. Howze, director of Army aviation, announced the first flight. The XH-40 is powered by the new Lycoming XT-53 shaft turbine, derated to about 700 hp. It is designed to be the highest performing helicopter ever produced. Bell Test Pilot Elton (Smitty) Smith made the first flight.

FIRST NEW 2-PLACE SILVAIRE MODEL 8F to be produced by Silvaire Uranium and Aircraft Co., Ft. Collins, Colorado, since it acquired Luscombe tools, jigs and parts from Temco, was delivered last month. Otis Massey, president of the firm, did the flight testing. The Silvaire 8F is powered by a 90-hp. Continental engine, is said to cruise at 120 mph., has 530-lb. useful load at 1,400-lb. gross weight, and features tapered tubular-steel Silflex landing gear.

BELL XV-3 CONVERTIPLANE SUFFERED MAJOR DAMAGE in a landing mishap last month which injured Bell Test Pilot Dick Stansbury.

TWO-DAY ON-THE-SPOT SURVEY OF GENERAL FLYING ACTIVITIES was conducted October 26-27 by 1,000 volunteer interviewers at 900 airports in all 48 states under sponsorship of the General Aviation Facilities Planning Group, composed of 11 associations and serving Edward P. Curtis, special assistant to President Eisenhower for aviation facilities planning.

NEW DALLAS PLANT OF MENASCO MANUFACTURING COMPANY was opened last month by Henry P. Nelson, president, with announcement the plant will build the landing gear for Temco Aircraft's Navy TT-1 primary jet trainer. The plant is currently producing components for the Convair F-120A and Nike missile components.

CENTRAL AIRLINES' NEW ROUTE EXTENSION FROM OKLAHOMA CITY TO DENVER, scheduled for Dec. 1, will make it possible to cross the continent entirely by local service airlines.

ROBB C. OERTEL, veteran manager of Esso Standard Oil aviation department, was elected president of the National Pilots Association last month at NPA's annual meeting in Chicago. Others elected are Henry Howard, Peoria, and Loretta Slavick, St. Louis, vice presidents; William Enyart, Greenwich, Conn., treasurer, and George H. Scragg, Cleveland, secretary. Retiring President Dwight P. Joyce, Cleveland, Oertel and Norman Larson of Van Nuys were elected to the 9-man board of directors.

SLICK AIRWAYS is moving its headquarters from Burbank to Dallas, according to Robert J. Smith, president, and has employed Horace Ainsworth of Dallas as its director of public relations.

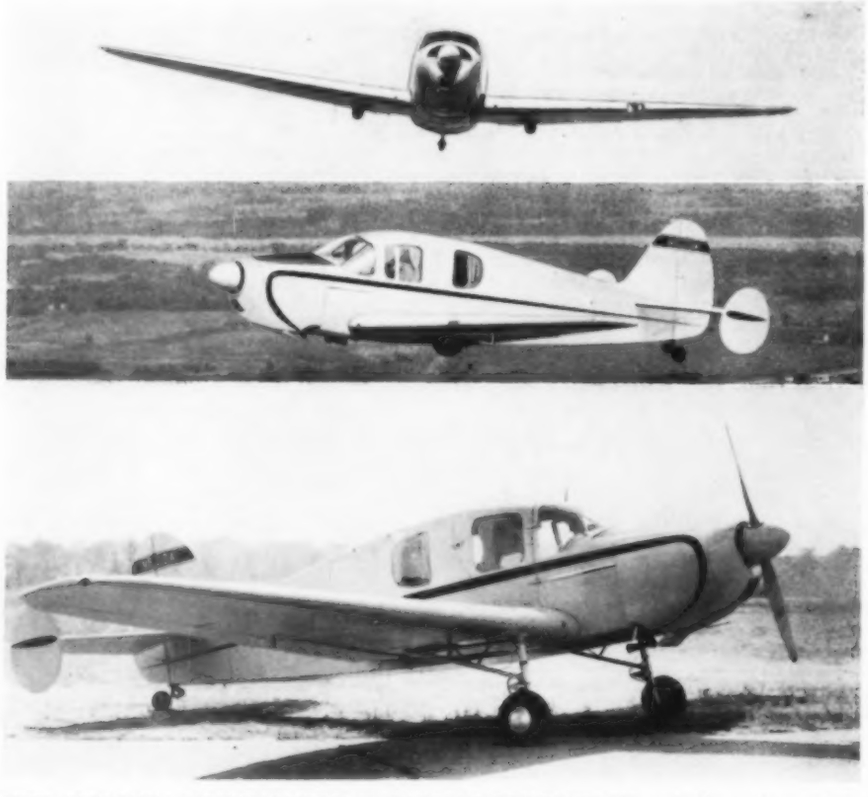
AMERICAN AIRLINES HAS OVERHAULED ITS 10,000TH AIRCRAFT ENGINE at Tulsa since opening its overhaul base there 11 years ago. Number 10,000 was a Wright TC18 3350 with 1,132 hrs. 51 mins. from a DC-7. The American shop employs nearly 4,000 people.

PERSONALIZED, DRAMATIC STORY OF BOEING AIRPLANE COMPANY'S HISTORY has been written by Harold Mansfield, Boeing public relations manager, and published as a book, "Vision, A Saga of the Sky," by Duell, Sloan and Pearce, New York, at $5.

GLENN L. MARTIN COMPANY will erect a 500,000-sq. ft. factory next year on a 7,400-acre tract near Orlando, Florida. The company and the city are working on plans for a new master terminal airport on or near the Martin site.

UNUSED AIRPORT FACILITIES IN MAINE SUITABLE FOR INDUSTRIAL ACTIVITIES are described in a 30-page brochure available from Arthur W. Wood, chief, State Department of Development of Industry and Commerce, Augusta, Maine.

LAWRENCE D. BELL, founder and chairman of Bell Aircraft Corp., died on October 20 of a heart attack. He was 62.



NEW BELLANCA CRUISEMASTER IS BACK IN PRODUCTION and three views of the $15,792 4-place, 200-mph. business plane are shown here. Manufacturer is Northern Aircraft, Inc., Alexandria, Minnesota, headed by Roy Strong, president. It is powered by 230-hp. Continental Model 0-470K engine driving a Hartzell constant-speed propeller. Top speed is 220 mph., cruising speed at 75% power is 205 mph., stalling speed 46 mph., rate of climb 1,250 fpm., service ceiling 20,000 ft., fuel capacity 55.5 gals. for 1,000-mile range, gross weight 2,700 lbs., empty weight 1,630 lbs., useful load 1,070 lbs., span 34 ft. 2 ins.; length 21 ft. 8 ins., height 6 ft. 2 ins., wing area 161.5 sq. ft. Retractable gear is hydraulically operated.

—(Northern Aircraft Photos.)

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Stapleton Airfield
Denver, Colorado

Cruse Aviation, Inc.
International Airport
and Clover Field Airport
Houston, Texas

Dal-Tex Aviation, Inc.
Highland Park Airport and Love Field
Dallas, Texas

Dixie Air Associates, Inc.
Municipal Airport
Memphis, Tennessee

Executive Aircraft Company
Municipal Airport
Kansas City, Missouri

Hair Flying Service
Harding Field
Baton Rouge, Louisiana

Howard Aero, Inc.
Service Division
International Airport
San Antonio, Texas

Poelman Aircraft Co.
New Orleans Airport
New Orleans, Louisiana

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Kenneth Starnes Aviation Service
Adams Field; Little Rock, Arkansas

Southwestern Skyways, Inc.
Municipal Airport
Santa Fe, New Mexico
and Ogden, Utah

Sunny South Aircraft Service, Inc.
Broward International Airport
Fort Lauderdale, Florida

Walston Aviation, Inc.
Civic Memorial Airport
East Alton, Illinois

WestAir, Inc.
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Abilene, Texas

Yingling Aircraft, Inc.
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HERE'S to the top man in business flying — long may he rule! Only by keeping him satisfied do we stay at the top with our Authorized Cessna Service Stations — in aviation as in any business, the one who progresses most is the one who gives his fellow men a little more . . . a little better service — LIKE OUR FAMOUS 1-2-3 CESSNA FLAT-RATE SERVICE!

1 You get an accurately quoted price and time-required quotation based on hundreds of job studies covering virtually all maintenance needs.

2 You get genuine Cessna parts and factory-trained workmanship.

3 You save money and time and we stand behind every job for your fullest satisfaction.

DOWNTOWN AIRLINE

(Continued from page 29)

to go through to get into the air transportation business these days. Only the hardy and well financed can survive. From our own observations the energetic young men operating Illini will make the grade if anybody can. Last May, for example, they bellied in their one and only Dove while taking off from Meigs Field. It was one of those rare accidents that probably will happen only once in their history. The weather was flyable VFR but a frontal passage was in the making. After the take-off run was started and about half way down the runway, before reaching single-engine speed, the wind shifted 180 degrees at about 50 knots. There was only one thing for the pilot to do to avoid putting a load of passengers in Lake Michigan — he pulled up the gear and bellied in. This quick-witted action saved the day but put the Dove out of commission for several months. It also proved what a magnificent airplane Mr. de Havilland produces. The gear came up immediately, not gradually. The insurance company assigned the job of repair to Illini, a tribute to the shop personnel of the little airline.

"This really hurt", says youngish Doug Harvey, World War II Naval pilot and president of Illini. "Just as we were going good with fine public acceptance of the Dove, we had to revert to the Apache and a Bonanza until we could purchase another one. We were fortunate also to find a third Dove on a lease basis and are back in business with expanded schedules. Our big hope is a 4-engine Heron we have ordered from de Havilland, with delivery expected in January. This plane will be put into non-stop commuter service between Rockford and downtown Detroit City Airport next Spring."

Illini's traffic manager, Leo Masiulis, predicts a better than 70 per cent load factor when the Heron gets into operation. By selling block time to companies and offering a "commuter rate" of 20 rides for the price of 15, they expect to break even on the operation with additional drop in business paying a profit. They also feel that their chances of a CAB certificate will be enhanced by the 4-engine equipment and by serving the "downtown" airports.

The big advantage of the Heron in addition to the passenger appeal of four engines will be its relatively low operating cost of $55 per hour (everything except depreciation). While it must sacrifice some load to keep under the restrictive 12,500 pound gross requirement, its 15-passenger capacity and greater freight capacity should hasten the day of break-even operations on the airline. Direct operating cost on the 11-passenger Dove is around $40 per hour.

Director of Maintenance Jack Hallen, has reached a Dove utilization figure of six and one-half hours a day. He predicts a seven-hour-per-day utilization for the Heron, which will provide two round trips daily between Rockford and Detroit, five days a week with a one-way flying time of one hour, 35 minutes. The Heron can also be used for week-end charter work. By next August, Illini expects to be running every hour on the hour from Rockford to Chicago's lakefront airport during daylight hours and to increase schedules to Detroit.

Total employment as of last month reached 50 people. This figure includes all airline personnel, shop, flight instruction, salesmen and executives. A Beech dealership under Butler Aviation is being set up. De Havilland of England has shown its interest in the operation by assigning a service representative to the company on a temporary loan basis.

Last August Illini filed an application for a certificate of convenience and necessity with the Civil Aero-

now in service

The world's finest, quietest, longest-range aircraft. Opening a golden era in air travel. Newest and finest in flying luxury.

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nautics Board, with proof that they are fit, willing and able to establish a new airline service and with traffic figures to back up the need. Their present service between Madison and Chicago and Rockford and Chicago is not considered competitive with the two local service carriers serving these segments because Illini uses the downtown Chicago airport. Some of the proposed new routes spreading southward through Illinois might run into some resistance by Ozark Airlines, the certificated local service carrier in the area. But Illini has made every effort to establish a route structure and terminal airport service that is as nonduplicative as possible.

"We do not desire to compete with any present air service," Harvey maintains. "Our concept is strictly below the present local air service pattern and we want to provide services to towns and airports where service is not now available — in other words to fill up some of the 'white spots' on the air pattern map, in the area between the locals and fourth area of air transport, the helicopter services. Not only are we pioneering a so-called 'third' phase of air transportation, we are also pioneering in the type of airplanes needed to do the job."

The Greater Rockford Airport Authority has granted Illini an option to lease a new $530,000 hangar building about to be constructed on the Greater Rockford Airport. "We're behind these boys 100 per cent," Airport Authority Director Bob Selfridge told us during our interview. "Rockford is the second largest machine tool and die making center in the country and we need more air service. We also need an airline based here as we intend to make the Rockford Airport one of the nation's outstanding all-purpose commercial fields, including designation as a Chicago international alternate."

With the certificated local service carriers moving more and more into a pattern that closely represents regional semi-trunk services instead of the original small "feeder" concept, we daresay the Civil Aeronautics Board and all others concerned with and interested in the future growth of air transportation will eventually give considerable thought, study and attention to the broad possibilities and implications of such operations as Illini Airlines. When one ponders the sad fact that only about 10 per cent of our citizens have ever been off the ground in an airplane, something will have to give, particularly in the areas where there just isn't any air service

CONVERSION #106

HOW TO BRING YOUR *DC-3 up-to-date*

Conversion Number 106 is a DC-3 brought up to date for a new and now satisfied customer. Executive Aircraft Service, Inc. concentrated on installation of radar electronic equipment, a new electrical system, A-12 Autopilot, new instrumentation and overhead panels, radio, PAA main gear wheel doors and an EAS Rudder Servo. The interior also was reupholstered. The ship now is relicensed for 26,900 lbs. and 1350 H.P. take-off. Result, a new customer is satisfied. Satisfied customers are our best recommendation.

L. V. EMERY
President

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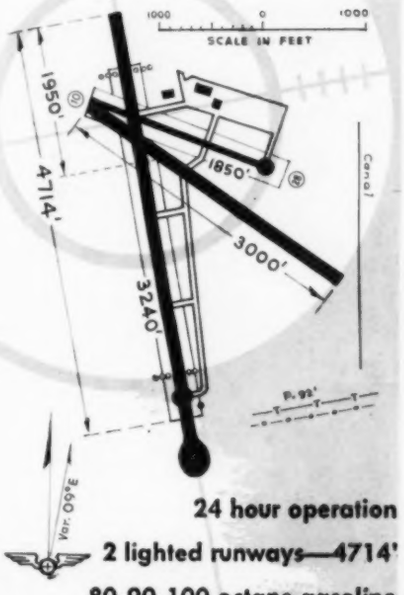

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or where route structures and frequency of service are little better than no service at all. This may be difficult to accomplish in an age when Big Government, Big Business and Big Operations tend to ignore history and forget that the oldsters were once "new blood" and that every giant today in aviation once was a struggling young company a great deal similar to such outfits as Illini Airlines with the same kind of problems.

If those in authority refuse to follow the philosophy that air transportation, like the railroads, has no more room for new blood or new services, we can look forward with confidence to a legitimate air age not only in the field of gargantuan intercontinental jet services but also in the field of grass-root American towns which have been thus far denied the advantages of adequate air transportation. ★ ★ ★

IT'S ALL IN THE RECORDS

(Continued from page 31)

planes — they are work planes. Company equipment and supplies make up the cargo manifests. In addition to the scheduled runs between the three bases, there are many special missions with DC-3's and the Bonanza. These include personnel and cargo transportation to back-country areas, in which the operations are more bush flying than anything else, with the air crew on its own. The cargo flown into the back country is as varied as the needs of an oil exploration or production crew. It has included a 4,000-lb. piece of equipment, drill pipe, sick people, dead people, household furniture — even million-dollar payrolls. Irwin's and Mene Grande's experience in Venezuelan flying dates back to Ford Tri-Motor and Lockheed 10 improvisations and the DC-3's have been a boon to the operation. These airplanes and the Beech Bonanza are maintained and operated to airline-type standards. Hundred-octane fuel for the DC-3's is readily available but 80 octane for the Bonanza must be imported and is expensive, handicapping that marvelous little airplane's normally impressive cost record.

Irwin's staff consists of 10 persons — Vernelle Irwin, chief pilot; Robert V. Morgan, pilot; Gildardo Emilio Vargas and Marcel Griot Casanova, co-pilots; Sebastian J. LoPresti and Malcol Robert Torry, mechanics; Pedro Rafael Munoz, clerk; Benito Rojas, foreman; and Benigno Rojas and Francisco Herrera, mechanic helpers.

In addition to the accurate and detailed records they maintain on t company's aviation operations, th also keep detailed records of passeng and cargo traffic. This enables t company to balance off its aviati costs on a realistic, airline-type bas The key to the problem is analysis costs on a pound-minute basis.

For example, the company's 195 record was reduced to the followin

	Two DC-3's	Bonanz
Total Expenses	$265,620	$18,63
Hours Flown	1,155:57	160:5
Total Flying Mins.	69,357	9,65
Total Thousand-Lb.-Mins.	192,301	5,031
Cost per M.-Lb. Min.	$ 1.38	$ 3.70

Against this is balanced the total cash outlay required if company personnel and freight had flown by commercial carriers, which was $293,450 for the DC-3's and $15,766 for the Bonanza. The result is that it cost the company $27,830 less than the commercial figure to maintain and operate its DC-3's on its own schedules, while the Bonanza cost $2,869 more than the commercial figure.

The figures, looked at another way, show that the two DC-3's cost $229.78 per hour flown at an annual utilization averaging 575 hours each,

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While the Beech cost $115.75 per hour flown at the low annual utilization of only 161 hours. Items which made up these costs are detailed in a table accompanying this article. They include many costs common only to operations in Venezuela and are not intended to indicate normal equipment costs as they are in the States, for example, or other areas. For instance, some $64,000 in airport costs are saddled to the airplanes, $59,534 of this being charged against the DC-3's and $4,789 of it against the Bonanza. The Bonanza operating costs include $1,151 for fuel, oil and grease covering only 161 hours of flying, which averages out at $7.15 per hour or something like 70 cents per gal. for 80-octane fuel. In contrast, the DC-3 fuel, oil and grease cost is carried at only $40.50 per hour, or less than 40 cents per gal. for 100-octane fuel.

Accompanying this article is also a table giving cumulative aircraft operating data and costs, and it furnishes many interesting entries. Since the company acquired the three airplanes, they have accumulated a total of $2,334,836 in expenses, of which fixed expenses total $1,068,257 while variable expenses have amounted to $1,266,579. About half of the fixed expense has been salaries and wages for flying and maintenance crews. In variable expenses, aircraft and engine maintenance, including spare parts, has amounted to just under 50 per cent of the total, while fuel and oil accounted for almost 25 per cent of the total. The table provides an interesting study of business flying costs and how these costs are compiled to provide management with accurate accounting. Such records are of great value to management in charting future aviation operations and future equipment acquisitions.

But determining over-all costs gives us only half of the business flying picture for Mene Grande and what it accomplishes. While the three airplanes, since their acquisition, have averaged $219.66 in hourly costs, of which $100.50 per hour has been for fixed expense and $119.16 per hour has been for variable expense, they have accomplished a large volume of work in the air. Passenger-miles flown, for example, have totaled 9,894,000 for 10,629 hours of flying. This is a lot of air work, but it actually represents only about 33 per cent of the total passenger-miles available in the 20-passenger DC-3's and 3-passenger Bonanza when their potential work capacity is analyzed. Here is a key to company aircraft operating experience,

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To quote from Mr. Leighton Collins, writing editorially in the December 1955 issue of AIR FACTS concerning "U.S. Group" insurance, "..... ***we believe this is the most secure insurance contract ever issued in the history of the insurance business.***"

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as it applies to all companies and not to Mene Grande in particular. Private airplanes, unlike scheduled airline equipment, seldom even approach the utilization limits designed and built into their airframes, engines and equipment. The business airplane's usefulness is not found solely or mainly in the volume of flying it does — it is chiefly useful and valuable because it is available when commercial aircraft are not, and its flexibility allows its use into areas and destinations where commercial flights are not operated.

The remarkable feature of business flying operations is that they prove their worth even at low levels of utilization. In the case of Mene Grande, for example, the records show that its aircraft costs have averaged only 8 cents per available passenger-mile and only 24 cents per passenger-mile actually flown. These costs are especially impressive when the handicaps are considered which make Mene Grande's costs above normal, because the operation is isolated from the usual sources of economical supplies and heavy maintenance.

Accounting records, as interesting as they are, never show all the benefits which a company such as Mene Grande derives from operating its own aircraft. Emergency cargoes rushed to exploration or production sites inaccessible by other means can more than pay for the entire aviation department's annual expenses with the savings accomplished on a single flight, for example. Business transacted at a distant point, otherwise impossible to accomplish, may avoid corporate losses or produce additional profits sufficient to justify the aviation department's operations for a decade — all because of a single air trip. These advantages of business flying have proved sufficient in many corporations to justify aviation operations. But even without listing these vital assets, the Mene Grande records provide an interesting and outstanding example of corporate flying's value to modern, progressive industry.

29 Pilots and 26 Firms Get Million-mile Safety Awards

TWENTY-NINE pilots and twenty-six corporations have been issued 1956 safety awards by the National Business Aircraft Association for having flown business aircraft 1,000,000 miles or more without accident or injury, the awards representing a total of 34,105,978 accident-free miles for "million-miler" pilots and 47,036,788 accident-free miles for the corporations. The awards go to companies and pilots who are NBAA members and while they represent a great volume of business flying, they amount only to a fraction of all accident-free business flying in the United States.

J. Victor Swanson, chief pilot for Sears, Roebuck, Chicago, was chairman of the NBAA awards committee, which annually cites members for safety records to focus public awareness on business flying's remarkable safety records and to call attention to business flying growth. Rules and regulations governing the awards are rigid and based on the accident reporting standards of the American Standards Association and the National Safety Council.

Twenty-six firms received meritorious awards for records of 1,000,000 or more accident-free and injury-free miles flown in business aircraft, as follows:

For 3,000,000 to 4,000,000 Miles—Monsanto Chemical, St. Louis, 4,272,894; Burlington Industries, Greensboro, N. C., 3,596,701, and Esso Shipping, New York, 3,556,895.

For 2,000,000 to 3,000,000 Miles—Columbia-Geneva Steel, San Francisco, 2,632,885; Southern Natural Gas, Birmingham, 2,493,862; Hercules Powder, Wilmington, 2,292,112.

For 1,500,000 to 2,000,000 Miles—International Harvester, Chicago, 1,937,250; International Paper, Mobile, 1,897,557; Owens-Illinois Glass, Toledo, 1,816,265; Kroehler Manufacturing, Naperville, Ill., 1,752,200; Minneapolis-Honeywell, Minneapolis, 1,635,000; Cluett, Peabody, New York, 1,597,500, and Proctor & Gamble, Cincinnati, 1,584,754.

For 1,000,000 to 1,500,000 Miles—Anchor-Hocking Glass, Lancaster, 1,430,000; Minnesota Mining, St. Paul, 1,421,969; Texas-Illinois Natural Gas, Chicago, 1,397,520; Thompson Products, Cleveland, 1,370,000; Holley Carburetor, Van Dyke, Mich., 1,286,852; U. S. Steel, New York, 1,285,240; Essex Wire, Ft. Wayne, 1,267,000; Armco Steel, Middletown, 1,174,248; S. J. Groves & Sons, Minneapolis, 1,110,000; Texas Gas Transmission, Owensboro, 1,100,000; Universal Moulded Products, Philadelphia, 1,046,544; Delta Drilling, Tyler, Texas, 1,044,000, and Champion Spark Plug, Toledo, 1,037,000.

Twenty-nine company pilots received "million-miler" safety awards for one million or more accident-free and injury-free miles flown in business aircraft, as follows:

For 2,000,000 Miles or more—Nelson U. Rokes, Proctor & Gamble, Cincinnati, 2,800,608.

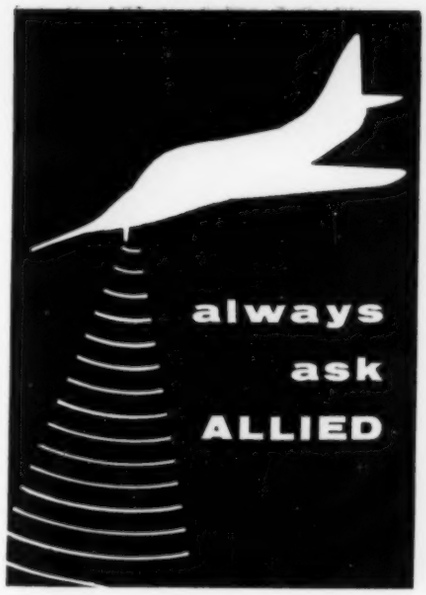
For 1,600,000 to 1,900,000 Miles—Jack C. Jones, Fairbanks Morse, Chi-

CESSNA 4-ENGINE MODEL 620 sales are directed by Guy Miller, shown above, appointed to the post last month by Frank Martin, marketing manager. Miller began his aviation career in 1927 in Pitcairn autogiros, was with Wings, Inc., at Ambler, Pa., from 1934 to 1954, and more recently was with Beech Aircraft in multi-engine sales.
—(Cessna Photo.)

cago, 1,800,000.

For 1,300,000 to 1,600,000 Miles—Col. E. W. Estelle, Esso Shipping, New York, 1,516,250; Robert F. Allen, Frankfort Oil, Tulsa, 1,488,379, and B. Owen Mayfield, Hercules Powder, Wilmington, 1,370,619.

For 1,000,000 to 1,300,000 Miles—Harvey H. Glass, Texas-Illinois Natural Gas, Chicago, 2,296,000; Richard N. Thurston, Monsanto Chemical, St. Louis, 1,226,048; C. H. Von Hollen, Union Bag, Franklin, Virginia, 1,200,000; G. W. Sherwood, Briggs Manufacturing, Detroit, 1,182,060; W. P. Hobson, Hercules Powder, Wilmington, 1,161,299; Norman L. Mitchell, Minneapolis Star & Tribune, Minneapolis, 1,156,750; Ralph E. Piper, Monsanto Chemical, St. Louis, 1,152,000; Raoul Castro, International Harvester, Chicago, 1,153,039; George E. Meyers, Monsanto Chemical, St. Louis, 1,150,000; W. R. Dotter, International Harvester, Chicago, 1,141,216; Thomas J. Schuetz, International Harvester, Chicago, 1,140,969; C. J. Lund, International Paper, Mobile, 1,131,700; J. Sheldon Lewis, Thatcher Glass, Elmira, N. Y., 1,108,000; S. M. Maxwell, Burlington Industries, Greensboro, N. C., 1,107,915; L. P. Cornwall, Chrysler Corp., Detroit, 1,075,000; Al Eager, Crane Co., Chicago, 1,071,000; Loren D. Kirby, Universal Moulded Products, Philadelphia, 1,046,544; G. P. Rider, Delta Drilling, Tyler, Texas, 1,044,000; James E. Kidd, Anchor Hocking Glass, Lancaster, 1,034,600; Orville E. Sparks, Holley Carburetor, Van Dyke, Michigan, 1,019,024; Robert L. Hansen, Kroehler Manufacturing, Naperville, Illinois, 1,017,650; D. M. Teel, U. S. Steel, New York, 1,017,000; Robert J. Kusse, Freuhauf Trailer, Detroit, 1,013,308; A. C. Korb, Westinghouse, Pittsburgh, 1,000,000.



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Questions and Answers for Airport Operators

Notes on the 1956 National Airport Conference

AGAIN it was our pleasant duty to attend the National Airport Conference held annually at the University of Oklahoma Extension Study Center at Max Westheimer Field in Norman, Oklahoma, in October.

From the moment Joe Coulter started procedings with a barbecue and party on Wednesday, October 3, until Al Williams had everyone on his feet at the close of the banquet Friday night, it was a typical Norman Conference — only better. For those who weren't there we made a few notes for you to put in your little black book as things you missed.

Sometime get Burrell Tibbs to give you his account of the curiosity of a couple of airline crews who tried to slow down their speed to see what he was flying back in 1953 when he ferried a Jenny from Illinois to Texas. This happend when he was crossing the Mississippi.

Jimmie Kolp was there to renew old acquaintances and a lot of people were glad to see her. . . . Then along came that promising real estate developer, Johnny Burke, who hasn't changed a bit. . . . Walter Betsworth from Waterloo, Iowa, was there, complete with the sense of humor that has kept him younger than most. . . . Bob Schmidt, Sally and Cindy from Tucson came in early and stayed late. Bob was in his usual form and he can take that remark anyway he likes. His toilet water souvenirs were better than a hole-in-one.

We missed part of this one but in contest labelled "This Worked at M Airport," Clyde Sharrer won tw tickets to the Saturday Oklahom game. . . . Ellis Carson of Ord, Ne braska, an old standby at Norma Conferences, was back after an ab sence of a couple of years and wa cordially welcomed. . . . Jack Keele from Pueblo, Colorado, was on hand again, as was Joe Marriott from Riverside, California. . . . Al Tavani from Providence, Rhode Island, came down and made a memorable appearance on the program. Get him to tell you about his island airport and what it did for the economy of half a hundred people.

Steve Mathews, city manager of San Antonio, made an effective speech on the program and stayed to get acquainted with a lot of people. . . . Elliot H. Gray flew in from St. Thomas, Virgin Islands, in a T-bird and stayed till the end. . . . Luis Zeledon of Costa Rica came up from Brownsville where he has been working with Frank Henggeler while studying airports in this country. . . . We'd like to give the whole list of those who attended and made the Conference a real success from Josh Couch down in Montgomery, Alabama, to James Gooder from Casper, Wyoming, but it would take too long.

The banquet speaker was Major Al Williams of Elizabeth City, North Carolina, but the real closing touch was Major Al's soft touch on the piano in room 7 about 1:30 Saturday morning.

Airport Rates and Charges

QUESTION: In considering the rate and charge structure at our airport, I find we need to compare what we propose to charge with the charges assessed elsewhere. Where can we get such figures?

ANSWER: Rates and charges at

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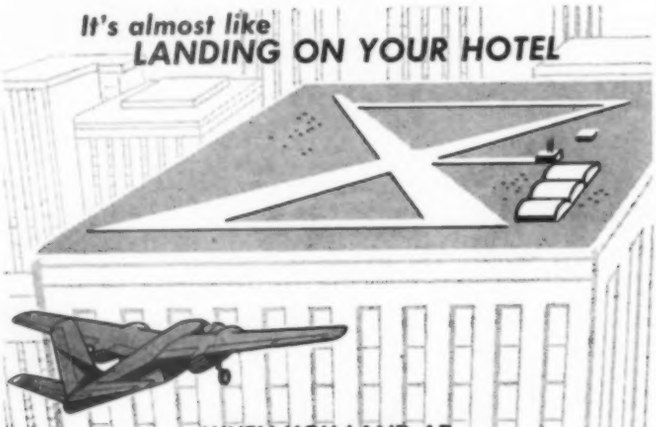

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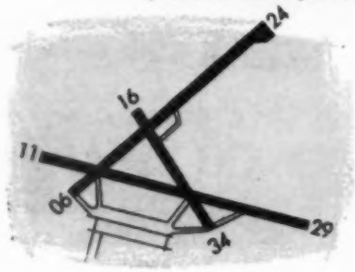

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(Dallas Aero Service Photo.)

airports have been published from time to time in various surveys and books but the difficulty lies in the fact that none we know are current. Some are, in fact, several years old and many of the rates and charges may have been changed.

The natural course to come to mind in your situation is to send out a questionnaire, but we recommend against that course. If every airport manager in the country resorted to that method, airport managers everywhere would have several hundred pieces of mail to answer and their Christmas cards would be late. Be very sure that you need and will use the figures after you get them. Then select the airports which appear to fall into a category similar to yours. Then see if any organization you belong to can make them avialable to you. If your airport is in a town of fifty thousand people, you would find no basis of comparison with a schedule of rates from Los Angeles for example.

Correspondence Courses

QUESTION: For the past few months I have been assistant manager at my airport. The manager seems to be satisfied with my progress and gives me what might be called a course in training. The more I learn, however, the surer I am that I've got a lot to learn. Is there such a thing as a correspondence course in airport management which I could take?

ANSWER: A number of universities and colleges have in the past included airport management courses in their curricula both in day and night classes. There are a number of schools, we believe, which still prepare students to be managers. However, we have no information on any which may have available extension study courses of the type you describe. There is every likelihood such a course would be a sound thing if it were available. We would suggest that you write to any schools advertising in aviation periodicals to see whether they can make such courses available. If they can, let us know so that we can have the answer for any others who may write. It has always seemed logical to us that a thorough, down-to-earth study course on airport management and operations by mail would fill a need for new managers and assistants who have not had experience or training.

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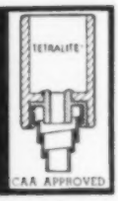

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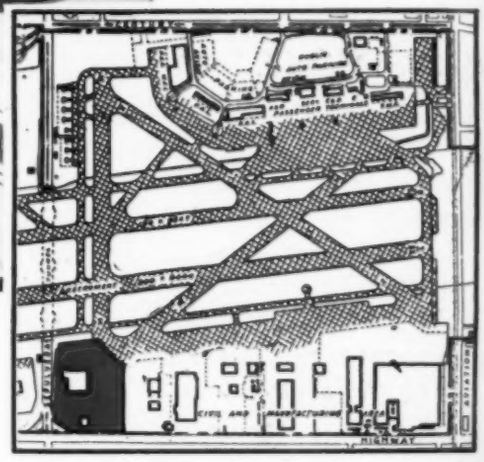

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